

AUTOMOTIVE INDUSTRIES

AUTOMOBILE

Vol. 66

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Contents

Shun the Excise-Tax Overload. By L. W. Moffett	111
Just Among Ourselves	113
S.P.A.R. Unites Studebaker's Non-Vehicle Merchandising. By Norman G. Shidle	114
Production Lines	118
Road Conditions Approached on Machine for Laboratory Tests of Brake Linings. By Langley W. Isom	120
Schwarz-Cycle Engine Differs From Otto Type	121
Durant Offers Two Lines for 1932	122
Semi-Automatic Clutch Available on Reo Lines	123
Consider India, Where the Bus Man's 'Prentice Is Cock of the Village Walk. By Mohamed Ally Khan	124
Waukesha Exhibits Six-Cylinder Diesel With Solid Injection	125
Lanova Diesel Engine Has Ordered Air-Flow	126
Franklin Exhibits V-12 at New York	127
Automotive Oddities	128
News of the Industry	129
Calendar of Coming Events	138
Advertisers' Index	50-51

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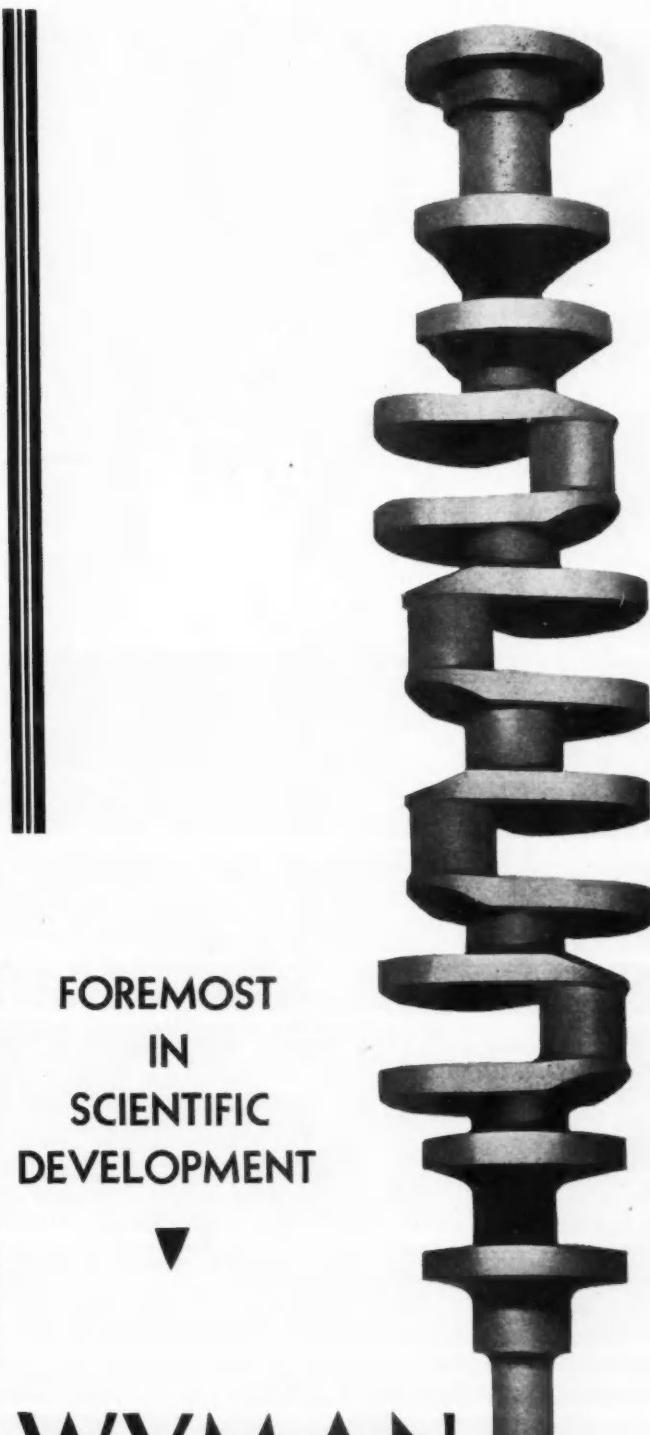
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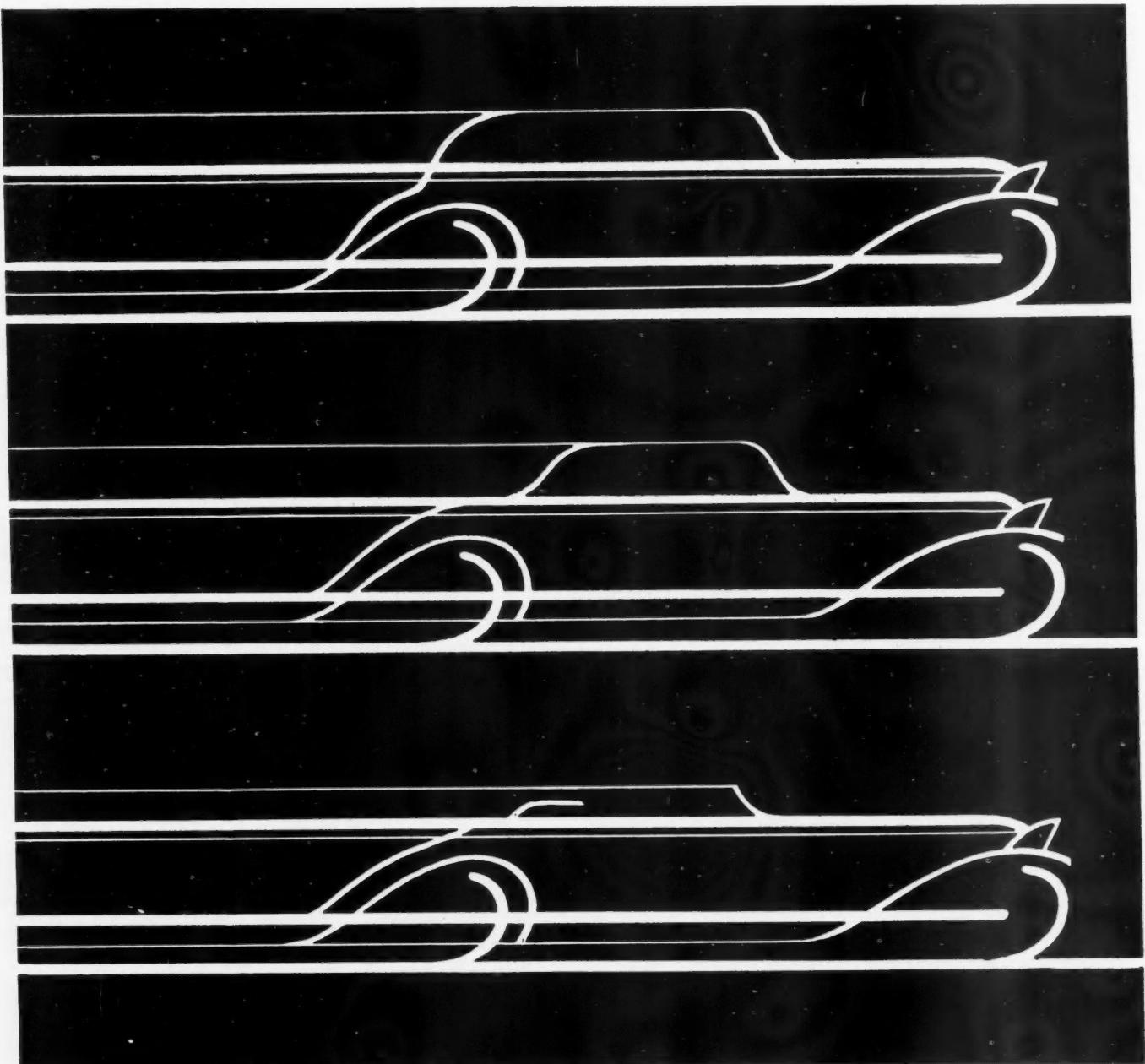


FOREMOST
IN
SCIENTIFIC
DEVELOPMENT

WYMAN-GORDON

AUTOMOTIVE & AVIATION
FORGINGS
WORCESTER, MASS.
HARVEY, ILL.

90-MILE- AN-HOUR-



AUTOMOTIVE INDUSTRIES

VOLUME 66

JANUARY 23, 1932

NUMBER 4



Shun the Excise-Tax Overload

by
L. W.
Moffett

EVERY member of Congress has been told the policy of the automotive industry regarding taxation. Each knows the industry is strongly opposed to the administration proposal for reinstatement of excise taxes on manufacturers' sales of automobiles, trucks and accessories. Such taxes are held by automotive leaders to constitute a direct discrimination against one of the largest industries in the country and to deal a body blow to motor vehicle, parts and accessory manufacturers in their efforts to rehabilitate their business.

The position of the automotive industry has been made known to Congress in letters sent to each member by Roy D. Chapin, chairman of the Taxation Committee of the National Automobile Chamber of Commerce and chairman of Hudson Motor Car Co.

Backed by the solid congressional delegation from Michigan in the House and the Senate, together with a general sentiment in Congress against sales taxes, prospects of the automotive industry for defeating the proposed levies look bright at the moment.

The industry, however, does not intend to assume a feeling of self-assurance and go no further. Rather it will actively oppose the sales tax program when its representatives appear at hearings on taxation. These hearings will first take place before the House Committee on Ways and Means, which originates all revenue legislation. Chairman James W. Collier (Dem.), Mississippi, has set today (Jan. 23) the date

for beginning of the hearings. Representative James C. McLaughlin (Rep.), Michigan, a member of the Ways and Means Committee, told *Automotive Industries* that the automotive industry will undoubtedly make a full presentation of its policy against sales taxes when its representatives appear before the committee.

Meanwhile its policy, as outlined in letters sent to members of Congress by Mr. Chapin, may be briefly stated as follows:

The proposed taxes would be a discrimination against the industry, one of the largest in the country.

The public debt was incurred for the general good and everybody should contribute to its payment.

No one industry should be signaled out to bear more than its fair share of the general burden.

Reimposition of these taxes at this time would constitute a body-blow to the manufacturers in their effort to rehabilitate their industry. In times like the present the public insists on lower prices. Motor vehicle manufacturers have met this demand by drastic economies. All of these efforts would be offset if these taxes were reimposed.

No considerable revenue, in the light of the total needs of the government, would be raised by an excise tax on automobiles and trucks except by severe levies.

On the basis of present production, \$50 per car would be necessary to net the government \$100,000,000. When it is remembered that more than one-half of the

motor vehicles sold during the past year were in the low price class, it will be seen that such impositions as these would be a serious restrictive charge to automobile purchase.

Users of motor vehicles are now paying the heaviest special taxes which are borne by any one class in the United States. Last year they paid more than \$1,000,000,000 in Federal, state and local treasuries, through the medium of gasoline and personal property taxes.

In addition to these, as taxpayers they had to contribute to all the other costs of government according to their income or land holding, just as every other citizen does.

They have been willing to make these payments because they have received a special benefit in return in the form of improved roads, but they have never admitted the equity of the practice.

The suggestion that manufacturers would absorb any Federal taxes shows no knowledge of manufacturing conditions. The war excise tax was always passed on by the manufacturer to the consumer and this would certainly be the case if a motor tax was imposed.

The Federal tax would bear heaviest on the farmers and the laboring class, the largest purchasers of the low-priced cars which dominate the sales field today.

More than 4,000,000 people derive their livelihood directly or indirectly from the motor industry.

Any tax which would diminish the sale of these vehicles, as the proposed Federal levies would, would immediately affect employment in this large field and consequently curtail buying power.

In setting forth their policy, motor vehicle manufacturers have made it clear that they are ready to pay their share of any tax increases that may be made. But they insist that these taxes should be fairly proportioned, rather than passed upon a discriminatory basis such as the reimposition of the excise taxes on the industry would be.

President Hoover urged assessment of the sales taxes upon recommendation of the Treasury Department. It is proposed to reinstate those carried in the 1924 revenue act.

These taxes are: "On automobile truck chassis and automobile wagon chassis sold or leased for an amount in excess of \$1,000 and automobile truck bodies and automobile wagon bodies, sold or leased for an amount in excess of \$200, including in both cases tires, inner tubes, parts and accessories, 3 per cent."

Other automobile chassis and bodies and motorcycles, including tires, inner tubes, parts and accessories, 5 per cent. Tractors are excepted.

Tires, inner tubes, parts or accessories, 2½ per cent.

One reason given for suggesting reenactment of these sales and other taxes carried in the 1924 act was that they would be easy to collect. President Hoover himself in his budget message said:

"The plan of approximately reenacting the revenue act of 1924 has the great advantage that the government is equipped by experience with similar legislation for its systematic and economical collection. The public has paid such taxes in the past and has found them not intolerable and has found they do not prevent increased prosperity."

While the sincerity of the President is not questioned, opponents of sales taxes point out that they should not be reenacted simply because they are easy to collect, itself a statement which has been challenged.

Press and public have thrown us the mantle of Moses for leading industry to prosperity; the job can't be done with additional burdens on sales

The contention is made that the basis of taxation should be its fairness, not more simplicity of collection. The automotive industry insists that sales taxes proposed are not fair, but are discriminatory, that they would retard prosperity, and certainly injure sales of motor vehicles, already restricted to a distressing point. By these taxes the industry, it has been pointed out, would be compelled to share a much greater burden of the taxation that should be imposed upon it and, through it, the general public.

The suggested annual revenue the administration proposes to raise is \$920,000,000, to be "definitely terminated in two years from next July." It is contended that the assessment on the industry would be altogether out of proportion, even if the taxes can be discarded at the time proposed. In view of the condition of the Treasury and falling rather than rising revenue, and the laggard condition of business, which must revive in order to substantially increase Treasury revenue, there are many who doubt that the increased taxes can be done away with as soon as is hoped.

The idea of motor sales taxes, while finding some strong supporters in Congress, also is looked upon by many as placing too great a load on the people generally, for purchasers of new cars represent a large segment of the nation's solvent population. This is seen in the ownership of cars and therefore prospects for new cars. Taking the agricultural population alone, it has been pointed out that there are 4,143,000 automobiles on 3,650,000 farms and that altogether there are some 20,000,000 car-owning families, representing approximately two-thirds of the families of the entire country.

Points of this nature have directed much opposition in Congress against motor and other sales taxes. Perhaps the strongest sentiment against them is reflected among Democratic members, who control the House and its committees, and constitute 46 of the 96 Senators. This is not to say all Democrats will oppose motor sales taxes. On the other hand it is also true there are Republicans in both houses who are opposed to the taxes. It would appear, therefore, that the probability of their enactment is slight.

No accurate picture can be made until the programs have been determined upon, but defeat of motor sales taxes assuredly looks promising at this time. It is claimed that even some of the high administration officials are convinced that sales taxes on motor vehicles will never get through Congress. The general sentiment in Congress is to increase taxes on higher incomes, estates, inheritances, and other sources which indicate wealth or comfortable financial circumstances.

At the same time, it is questionable if it can be fairly said that the prevailing sentiment of Congress is to "soak the rich." The administration recommendations themselves are directed to a marked degree toward greater assessment of wealth, as well as broad-

(Turn to page 127, please)

JUST AMONG OURSELVES

Industry in Sharp Focus These Days

THE eyes of many industries are focused on the automobile business today. Financial writers, business men and politicians during New York Show week indicated time and time again their belief that our industry is being relied upon as the leader in the march back to prosperity. Yesterday Arthur Anderson, editor of *Boot & Shoe Recorder*, the dominant and leading publication in the shoe industry, asked us to write for his magazine an interpretation of the automobile show.

Perhaps you would be interested to read what we wrote—here it is in part:

More People Eager To Look, Ready to Buy

"PUBLIC interest is on the march! People are ready and eager to look at new products, to inquire about their details and to contemplate their purchase. More people are getting ready to buy than at any time in the last six months—and a few more are buying.

"This is the chief fact of significance developed by the New York Automobile Show, which closed Jan. 16 after a week of displaying to far greater crowds than in 1931 a really striking assortment of new motor cars, characterized by easy-to-see and easy-to-understand improvements in design and by the lowest prices in the history of the industry.

"Car makers exhibiting during Show Week took the names and addresses of at least 50

per cent more people as actual prospects than they did during the 1931 Show. Actual sales in some lines were considerably better than last year, and the total probably ran a little ahead.

"Car manufacturers in general left the New York Show feeling more confident and more encouraged than when they arrived; and most of them had arrived with faith in the ability of their industry to register some improvement over the low levels of 1931."

Sage Jester Jousts Standpat Attitude

A MAJOR event of automobile show week in New York was the initial appearance of Bill Stout, airplane designer and humorist, as a member of the S.A.E. Council.

Attending his first Council meeting, Mr. Stout immediately plunged into the discussion of S.A.E. ("Get Your Man") membership campaign which is about to start with a suggestion gleaned from his well-known intimacy with the Norwegians of Minnesota. He told of a meeting of the Sons of Norway, called recently to discuss this same problem—that of increasing membership. When various suggestions had been made and discarded as to ways and means, a newly arrived member was asked for his suggestion. After brief introductory remarks, he suggested that they might readily increase their membership by changing the name of the organization to "Sons of . . ." (something else) and thus



be able to take in the Swedes, as well.

When the Council seemed unwilling to adopt this expedient, he apparently began to study the visages of the individual councillors, perhaps to try to discern the reasons for their sluggishness in adopting new ideas. But he concentrated, apparently on John Warner, S.A.E.'s well-loved general manager, and on ye writer of this here page, the latter of whom was wrapped in deep contemplation over the problem of how long the days and how short the nights seem to be during automobile show week. The results of Mr. Stout's study appear herewith. So far as his portrait of us is concerned, we can say with great assurance that Rembrandt at his best never pictured more accurately the emotional feelings of his subject than did Mr. Stout.





E. C. Mendler, who will direct the activities of the S.P.A.R. Sales Co. as vice-president and general manager

FORMATION of the S.P.A.R. Sales Co., a subsidiary of Studebaker Corp., was announced a few weeks ago. Now, for the first time, complete details are available regarding this latest car-manufacturer's move to better replacement parts merchandising practice. The facts about this new operation are of vital interest to every automotive man; implications which perhaps, may be drawn from these facts are even more significant.

S.P.A.R. Sales Co. now handles the sale of replacement parts for Studebaker, Pierce-Arrow, Rockne and S.P.A. Truck Corp. products. Accessories will also be sold by S.P.A.R., as will both general and specialty repair shop equipment and tools for Studebaker, Pierce-Arrow, Rockne and S.P.A. truck service stations. Dealers and distributors in all these lines will purchase all such units directly from the S.P.A.R. Sales Corp.

The basic thought back of the organization of this new unit, according to Paul G. Hoffman, president, was to put the parts merchandising activities of Studebaker-owned companies on an active, well-defined basis consonant with modern merchandising necessities in this field.

Distribution or parts ordered will be made through twelve S.P.A.R. parts ware-

S.P.A.R. Unites

Depots in principal cities will supply both Studebaker dealers and independents with parts, accessories and shop equipment at stabilized prices

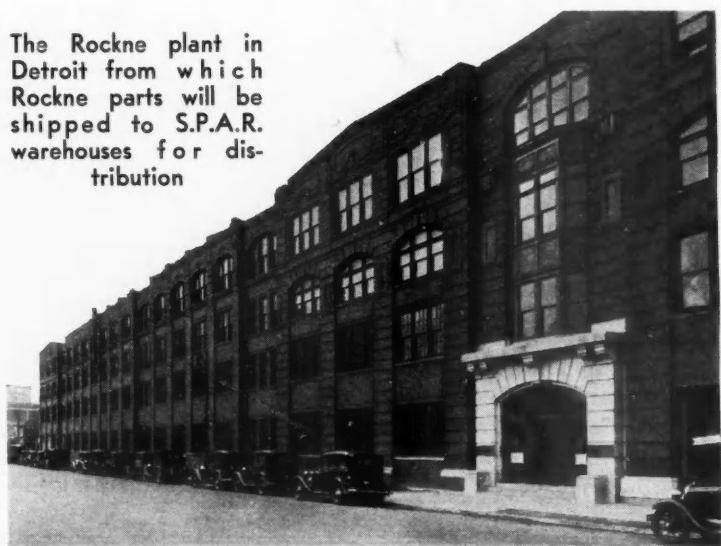
houses, which have been set up for this purpose at the following points:

Portland, Me.	Kansas City,	New York,
San Francisco,	Mo.	N. Y.
Calif.	Dallas, Tex.	Detroit, Mich.
Los Angeles,	Atlanta, Ga.	Buffalo, N. Y.
Calif.	Boston, Mass.	South Bend,
St. Paul, Minn.		Ind.

Each of the warehouses carries a large inventory, the size of the stock varying, of course, with the number of cars actually operating in the territory. No warehouse carries or will carry less than \$75,000 of inventory, figured at distributors' prices. Stocks carried will range all the way from that minimum up to \$500,000 worth, this latter total being carried at the New York warehouse. Boston will average in inventory about \$100,000, Los Angeles about \$200,000, and so forth.

Parts stocked by particular warehouses will, of course, be determined by frequency of demand. Very

The Rockne plant in Detroit from which Rockne parts will be shipped to S.P.A.R. warehouses for distribution



Studebaker's Non-vehicle Merchandising

by Norman G. Shidle

slow-moving material will be centralized at South Bend, Buffalo and Detroit. Dealers and distributors will order all material through the branch warehouse in their territory. Any items not available at the branch warehouse will be ordered by the branch warehouse from the main depot to be shipped directly to the dealer.

Independent repair shops can have parts delivered to them from any warehouse with dealer's sanction.

Generally speaking, no warehouse except those in South Bend and Buffalo will stock complete engines, complete bodies or frames. If the demand for such items seems to justify such inventory at any particular warehouse, however, stocks of these items will be added.

A variety of warehouse facilities are being used, but rented premises are employed in most instances.

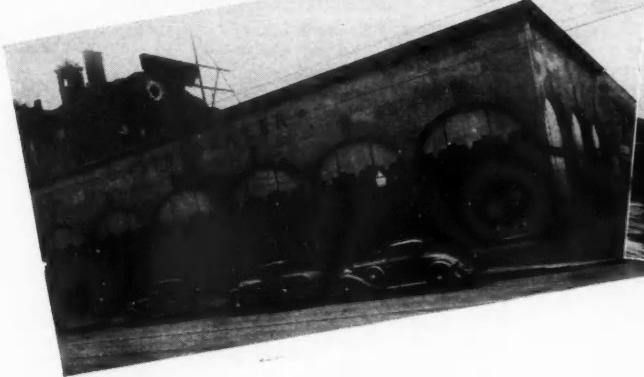
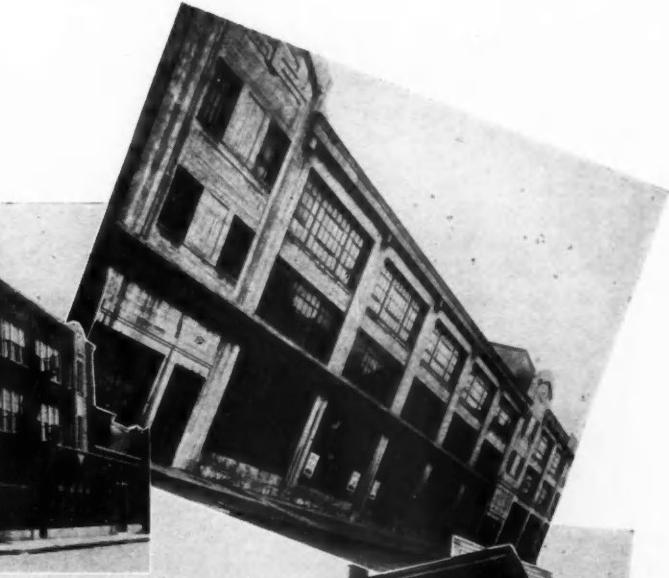
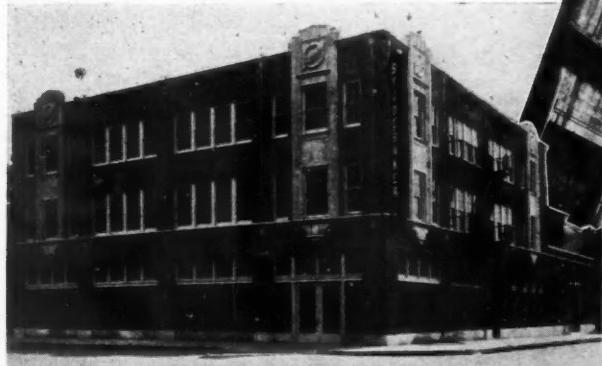
In some cases the warehouses consist of premises in buildings owned by Studebaker distributors and rented by S.P.A.R.; in other instances premises rented will be in conjunction with the factory branch office of one or another of the Studebaker subsidiaries. No public warehouse space is being rented by S.P.A.R. at present.

The personnel at the various warehouses varies, naturally, with the volume of the operation. The smallest warehouse employs four people, and the largest—the main depot at the Studebaker factory in South Bend—one hundred and fifty. Parts salesmen are being operated out of each of the warehouses, while local over-the-counter sales are made as well.

S.P.A.R. does not contemplate operating its own trucks for delivery of parts to dealers, but is prepared to resort to this mode of transportation wherever and whenever it would result in favorable rates. It will continue the Studebaker policy of paying full rail freight transportation charges on all parts going to dealers in shipments weighing 100 lb. or more.

Parts prices will be the same to both dealers and distributors. This is merely a continuance of the

Studebaker outlets in (reading clockwise) Dallas, Boston, Atlanta and St. Paul in which space will be used as distribution centers for S.P.A.R., handling all Studebaker lines



parts price policy, inaugurated by Studebaker some eight or nine months ago, which is based on theory, evolved from experience records, that the distributor can never function except to a very limited degree as an active factor in parts wholesaling.

Beginning at once, all parts will be priced to dealers and distributors on a definite net price basis. Specific list prices as well will be established on each part. Dealers and distributors contract to maintain that list price, neither raising nor lowering it for any cause. The net prices established represent the equivalent of discounts ranging from 25 to 60 per cent from the established list prices. All dealers and distributors will be furnished with a price list showing the list prices at which parts should be sold at retail and the net prices at which they can be purchased from S.P.A.R.

The establishment of a list and net price for each individual part with due regard to the competitive conditions applying to that particular part will, in the opinion of the S.P.A.R. executives, result in a substantial increase in volume and profit for both the car dealer and the manufacturer. It seems obvious that a set mark-up cannot be applied to 50,000 items differing greatly in character without creating serious sales resistance on a substantial percentage of them through inaccurate pricing.

While S.P.A.R. policies have been set up primarily with the thought of obtaining through constructive merchandising methods the greatest possible sales of S.P.A.R. parts to Studebaker, Pierce-Arrow and Rockne dealers, the new organization is definitely interested as well in broadening the distribution of its parts and accessories among independent repair shops as well. Its current policy on this important point has been well defined.



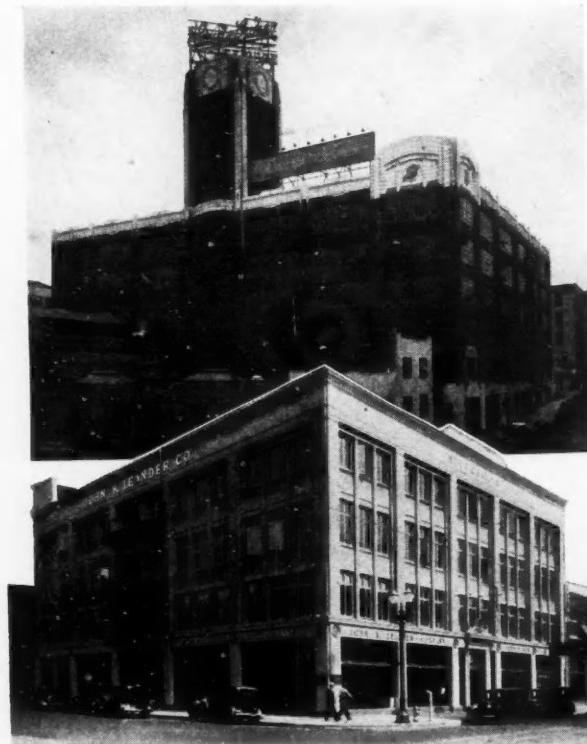
The Studebaker branch at Los Angeles, which will be used as one of the 12 S.P.A.R. distribution and sales depots

Outlining this policy in brief, E. C. Mendler, vice-president and general manager of S.P.A.R. Sales Co., states:

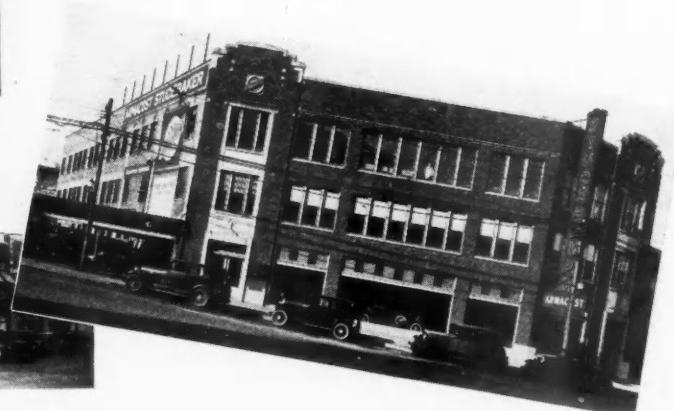
"We are vitally interested in exploiting the independent market, but for the immediate future will restrict the sales of S.P.A.R. parts to such independent garages as are approved by our car and truck dealers in the various territories.

"It is our hope that we may be able to induce every dealer to assume a more liberal attitude toward the independent garage, because we are convinced that—owing to the widespread buying of service on a convenience or availability basis—a certain number of Studebaker manufactured cars are always going to be serviced in these independent garages. So long as this is the case, we want those owners to be able to have our parts put into their cars as readily as possible. Frankly, moreover, we want to enjoy the full benefits of this important part of the replacement market.

"When independents call at our parts depots for



The Studebaker branch at New York and outlets (reading counter-clockwise) in Portland, Ore., and Kansas City, which will be links in the S.P.A.R. chain of warehouses



Studebaker facilities for shipping parts at South Bend are concentrated in special buildings with modern handling devices



parts and the dealer in the territory is unwilling to ratify our selling to him, we are going to do our best to sell the dealer on changing his mind."

S.P.A.R. car and truck dealers contract to sell parts to independent repair shops at a given percentage above the net price at which these dealers purchase the parts from S.P.A.R. Most items the dealer will sell to the independent repair shop at about 25 per cent above his own net purchase price. In the case of a few infrequently called for major items, such as complete engines, frames and bodies, the markup will be only 10 per cent.

Tying in closely with this parts distribution policy is the Claims Liberalization Policy issued by Studebaker Sales Corp. of America, which, it is understood, will apply to Pierce-Arrow, Rockne and S.P.A. service work as well. This Claims Liberalization Policy puts down in black and white and in well-correlated form all of the factory policies relating to the handling of policy replacements during the standard warranty period and kindred matters. The purposes of this policy are:

- 1—To insure immediate action with regard to car adjustments within the limits of the standard factory warranty.
- 2—To provide continuous contact between the dealer and the purchaser during the warranty period.
- 3—To provide dealers with a labor reimbursement in the amounts indicated in a Schedule of Allowance issued for that purpose, covering the replacement of parts installed by them under the warranty.
- 4—To permit national publicity on service.

The policy states, among other things, that: "Until further notice the policy will be continued whereby the Corporation will accept the judgment of its deal-

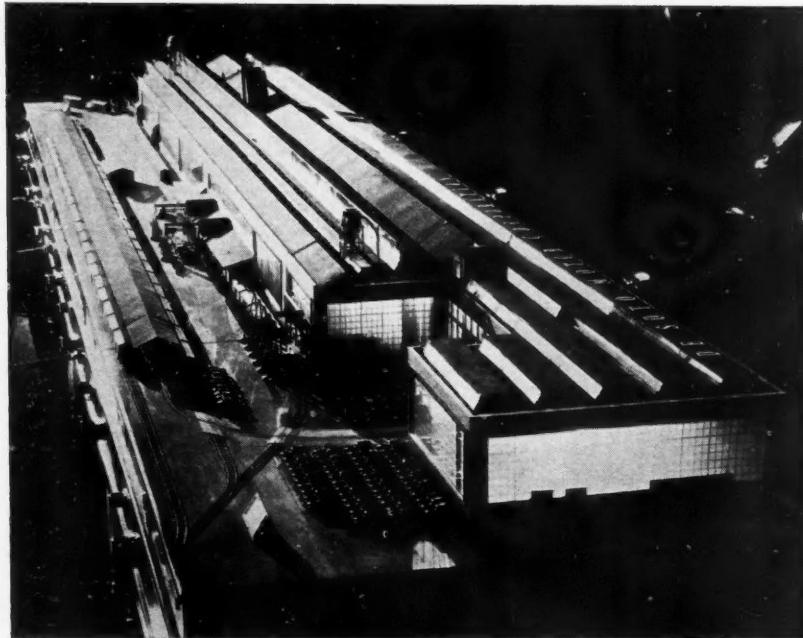
ers on parts claimed to be defective and replaced under the terms of the standard warranty, and which have not been subjected to misuse or neglect." It adds to this policy—which was first installed over a year ago—a factory labor credit to the dealer to cover the labor cost for installing parts judged defective. This latter provision is now incorporated by Studebaker for the first time.

The S.P.A.R. interpretation of the clause in the dealer contract regarding minimum parts stocks will be interpreted in a liberal manner, as in the past. Discussing this point, Mr. Mendler informs us that:

"We have never assumed a mandatory attitude in enforcing this provision, but rather by educational processes have attempted to convince the dealer of the advisability of carrying such parts stocks as were in our opinion necessary for his particular operation. The same policies will be pursued under the new arrangement.

"Arbitrary audits to determine adequacy of dealers' stocks will not be made. Our traveling men will, however, as in the past, establish friendly relationships with the dealer and offer assistance in all matters related to the parts phase of the dealer's business. These operations include such important features as stock arrangement, inventory control, ordering methods, proper selection of new parts and training of personnel.

"A liberal policy as regards obsolescence of parts in dealers' hands will also be continued. Through traveling specialists, however, we hope to reduce obsolescence to a minimum. The centralized bureau, heretofore operated by the Studebaker factory, will be continued by S.P.A.R. as an aid to relieving dealers of such items as become surplus in their stocks. This device has already afforded substantial relief to dealers in this regard."



It cost \$25,000 to get this replica of the home of DeSoto and Plymouth before the folks at the show. Does a good job of showing how the wheels go 'round. A goodly crowd collected every time the lecturer got on the job

Bringing in the Factory

Every time the loom started pounding out flat fabric the folks scurried around to see this unusual display. The American Woolen Co. certainly scored a hit in planting a bit of a textile mill at the big show. Incidentally, the factory men looking things over took time out to see it at close range.

Body Wrinkles

Three body builders strutted their stuff quite effectively. Murray is proud of the new Lincoln job; also the Hudson with the flowing lines. Both were shown at the booth. Philadelphia was there in force. Budd showed 'em how light a body could be. A full grown sedan in the metal scaled 375 lb. Heintz was there with one of the Hups.

Shot Welding

Incidentally, Budd supported the 375-lb. job on a slender tower of stainless steel. The framework was built up by shot welding, one of the latest wrinkles in the welding line.

Radiators Changing

Saw a goodly number of radiators dressed in paint instead of the cus-

tomary bright. Surface protection is offered by placing the filler under the hood. Will this be a trend?

Getting Attention

"Pearl essence" finish took the fancy of many onlookers. No getting away from it, it's mighty effective. We'd like to know more about it. How does it stand up in service? Consumer appeal is certainly there if the finish and color are durable.

Easing the Entry

Doors are wide—wider than ever. Making it easier to climb in. Three to four hinges per door and two dovetails in the bargain show that the extra weight and loading have been considered.

Alloy Now Protected

"Sil-Fos," a low melting point silver brazing alloy recently placed on the market by Handy & Harman, is now protected by U. S. Patent 1,829,903. Its melting point is 1300 deg. Fahr. Tests on copper lap joints are reported as showing tensile strength from 30,000 to 35,000 lb. per sq. in.

NEW YORK SHOW

Very Clever

Here's a little device that makes no end of a hit. It's that small unobtrusive word "Duplate" tucked in the corner of certain windshields and windows. Funny how it seems to stand out despite its shyness.

Ventilators Moving

Just as we were primed to get the lowdown on cowl ventilators they moved off the sides. With little exception, ventilators went back to the top of the cowl. In at least one case they are in the hood. Body silencing probably has a lot to do with this shift.

Hardware Age

Were you ever body-handle conscious? We were, through the kind agency of a body-expert friend. Grabbed literally hundreds of handles. Outside and inside handles as well as window lifters are longer, give better feel and leverage. Naturally some "feel" better than others. In one high-priced job the hardware is of tasteful, flat pattern. So flat in fact that our slender hand would not fit in without scraping the upholstery.

Bumpers Too

Perhaps with only a few exceptions, bumpers went on the single standard. It looks like a single, wide bar for 1932. Incidentally, this caused a little excitement in production because polishing equipment had to be considerably altered to suit a wider bar.

One Trend Out

Some one suggested some time ago that door hinges were about to hide. Maybe they will. But they don't on the show models. In fact hinges are very much in evidence, what with wider doors and more pronounced turn-under in door stampings.

REFLECTS PRODUCTION LINES

by
Joseph Geschelin

Right Around

Bumpers all round have been discussed in fact and fancy. Hupp has 'em this year. In addition to bumpers front and rear, they have a husky, chrome-plated tube shielding that extra long running board. These tubes are well braced from the frame.

Someone's Happy

Where are the shrinking radiator shells of yesteryear? Those at the show have blossomed into robust areas of bright plate. What with lamps, bumpers, grille, shells and gadgetry, it's an electroplater's dream. We suspect that the situation also has a mild interest for purveyors of chromic acid, catalytic radicals, process licenses, *et cetera*.

Artistic Metal Stretching

Met one of those rare individuals with that gifted touch for working in sheet metal. It's a treat to listen to these men. Appraising some of the metal work at the show, he recalled that only a few years back the experts said it couldn't be done. Don't forget that wonderful work has been done this year on bodies, fenders and the like. Major credit goes to die designers for the refinements that make possible some unusual metal stretching, also to the rolling mills for sheets that reflect metallurgical advance.

Pleats or Tufts

Several years back fashion decreed that tufted body trim was out. Cleanliness probably had something to do with it too. But body silencing may make it worth reconsidering. Although there is no scientific evidence to prove it, it is believed that tufted upholstery helps absorb sound. And may also damp reverberation by breaking up sound-wave fronts.

Psychology in Color

According to Howard Ketcham of the Duco Color Advisory Service, the general tendency at the show was to gayer and more vivid colors. Apart from the esthetic value of this the idea evidently is to sound a note of optimism. Accordingly black has dropped from first in 1931 to fifth this year. This is good business, for color has a fundamental appeal which certainly predominates in all humans.

Convertibles Clever

Clever work has been done in the design of convertible tops. Those at the show fold compactly out of the way, and practically blend into the body lines. Hupp has a job where the top disappears entirely. No boot, no fussing; the opening being covered by a chrome-plated, hinged top.

Rockne Scores

Rockne sprang a surprise with a body that's as modern as 1932. Sloping windshield, wider doors, streamlines and everything. We liked particularly the fenders which faired in so nicely with the gas tank lines at the rear.

Mighty Neat

Convertibles in the Studebaker line have a neat refinement in the form of a molded rubber corner at the top of the front door post. This guides the window and makes a weather-tight joint when needed.

Moving About

Gas filler caps are shifting about, what with the big trunks and boots. One maker continues last year's practice of carrying the spout through the rear fender. Several others have the cap flush with the boot on rumble seat jobs. In this

case, two caps are used, one on each side. This serves two purposes: formal balance and some protection from gas hose scuffing.

Hitting the Mark

Last year we had several articles in *Automotive Industries* regarding the production possibilities of centrifugal casting. The latest development in this country today is the centrifuse brake drum which is made by centrifugally casting an iron lining in a steel shell. We understand that another make will be on the market before we realize it.

Self-evident

Needless to say, one must be less than observant not to see that all bodies have gone streamline. Exceptions are rare in this year's crop. Characteristic features are: sloping windshields, no visor, well-faired rear panels usually encompassing the gas tank *a la Royale*.

Joining the Band Wagon

The show has added two more car builders to the list of those who believe that wrist pins should have pressure feed. Write them in on the table shown on page 383, *Automotive Industries*, Sept. 12, 1931. Connecting rods on these engines now are rifle-drilled. Chalk this up to P & W six-spindle machines.

Shifting Sands

Casual check shows that flat fabrics found wide acceptance at the show. More about this when our study is completed. Interestingly enough, several open models showed fabric instead of leather trim. Did you see the P-A with that striking deep blue broadcloth (at so much a yard) piped in yellow leather?

Road Conditions Approached on Machine for Laboratory Tests of Brake Linings

by Langley W. Isom

Multibestos Co.

AFTER a study of existing devices* the Multibestos Co., Cambridge, Mass., has developed an inertia-type machine which closely approaches road conditions for testing brake lining. Certain changes and improvements were incorporated in it, and the results now obtained, from most of the typical braking mechanisms, consistently accord with the results of road tests.

The Multibestos Co. has two such machines which are being run twenty-four hours a day in testing all kinds of brake linings on all types of brake mechanisms. Fig. 1 gives a fairly clear picture of the small machine for testing brakes and linings for light-weight cars.

Both machines are so constructed that air, mechanical or hydraulic brake mechanisms of all types and sizes are interchangeable on them. Thus it is possible to be running a test on a truck air-brake and within a few hours change the machine over to

* In the design of Multibestos inertia machines, the company was aided by the generous cooperation of the Johns-Manville Co. and their Dr. B. Townsend, whose general designs and fundamental ideas were incorporated therein, and due credit is given also to the Midland Steel Products Co. for the method of applying the braking effort.

run on a passenger-car mechanical or hydraulic set-up.

The Multibestos inertia machine is a dynamometer consisting essentially of a complete brake mechanism engaging a drum which is mounted on the main shaft of the machine. A flywheel of laminated disks is mounted on the main shaft of the machine and any moment of inertia may be obtained by increasing or decreasing the number of disks. The entire mechanism may be set so that the kinetic energy of rotation of the flywheel will be exactly equal to one-fourth the kinetic energy of translation of the moving automobile loaded with passengers.

Insofar as the kinetic energy of a car is absorbed approximately equally by the four brakes, the energy of the rotating flywheel need be only one-fourth of the energy of the moving automobile. The main shaft, the flywheel, and the brake drum can be rotated at the exact speed at which the wheels of the car revolve under the conditions which it is desired to duplicate. In this way, conditions of the road test are exactly reproduced, with the exception of the

(Turn to page 122, please)

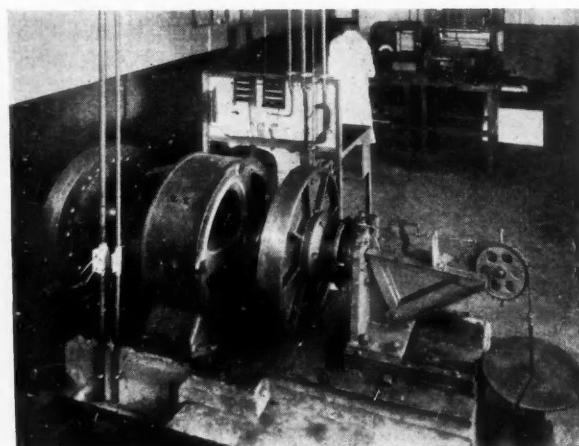
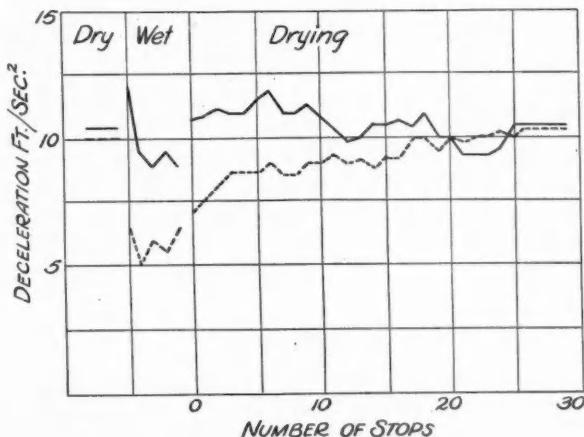


Fig. 1—Multibestos inertia-type brake testing machine

Fig. 2—Results of "water test." Stops made from 30 m.p.h. pedal pressure, dotted line, 50 lb.; full line, 70 lb.



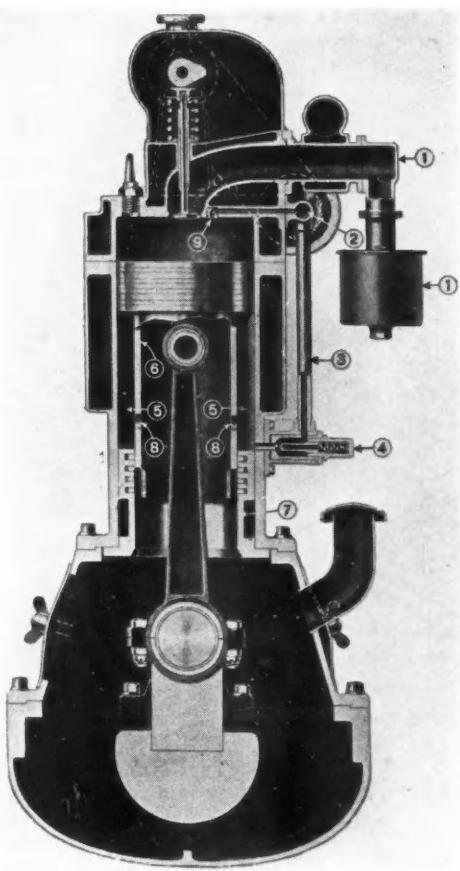


Fig. 1—This sectional drawing illustrates the general arrangement of parts in a Schwarz-Cycle engine

AN internal combustion engine operating on a cycle somewhat different from the conventional Otto cycle has been developed by Alfred I. Schwarz, and the patents thereon are controlled by the Schwarz Cycle Engine Corp. of New York. The chief feature of the cycle is that during the compression stroke air compressed by a pump or compressor—which latter may be built integral with the engine—is forced into the combustion chamber, thereby adding to the air or oxygen content of the chamber at the end of the compression stroke and at the same time creating considerable turbulence therein.

A cross-sectional view of the engine in diagrammatic form is shown in Fig. 1. The general arrangement of the principal parts is similar to that in the conventional automobile engine. Exhaust and inlet valves are arranged in the cylinder head, and a carburetor 1 is connected to the inlet valve port in the usual manner. The valves are shown as being operated from an overhead camshaft.

The piston, however, differs from the conventional design and is of what is generally referred to as the stepped type. Below the ring belt it is reduced in diameter, and at the bottom of the cylinder there is an annular insert or air compression ring in the bore, which serves as a guide for the reduced portion of the piston. Between the cylinder wall, the wall of the reduced portion of the piston, the shoulder on the piston and the air compression ring there is formed a chamber of variable capacity which serves as the pump chamber. Air enters this chamber

Schwarz-Cycle Engine Differs From Otto Type

Air injection during the compression stroke adds to oxygen content in cylinder. Higher torque and lower fuel consumption than in engines of similar dimensions claimed

through ports in the wall of the reduced portion of the piston when the latter approaches the top end of its stroke. As the piston moves down, these ports are closed by being masked by the air compression ring. During the remainder of the down stroke of the piston air is compressed in the annular chamber 5.

The air thus compressed passes through the check valve 4 and the compressed-air supply riser 3 to the rotary valve 2, which is driven at camshaft speed. This valve extends the whole length of the engine and forms, together with the risers, a compressed air supply reservoir. The interior of the tubular valve is open to each riser during the latter part of the down stroke of the corresponding piston. Communication between the interior of the valve and any particular cylinder is established when the piston in that cylinder is 130 deg. from the end of the compression stroke. The air valve remains open till the piston is 10 deg. from the top of the compression stroke, and during this 120 deg. of crank

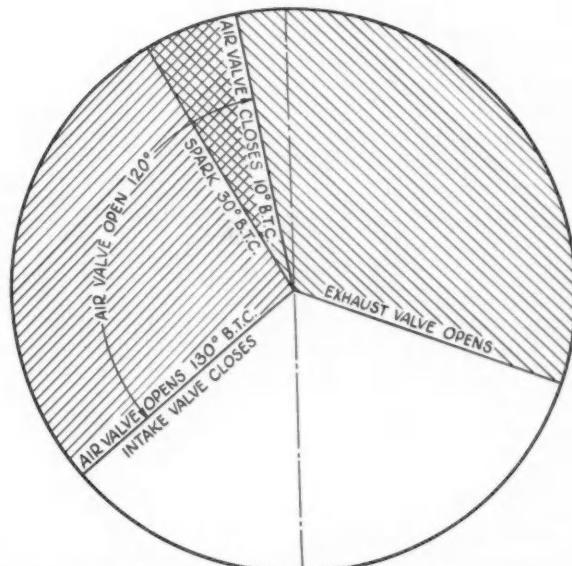


Fig. 2—Diagram of Schwarz cycle

motion, since the air in the reservoir is under higher pressure than that in the combustion chamber, additional air is forced into the combustion chamber through the nozzle 9. The complete Schwarz cycle is illustrated by the diagram Fig. 2.

In order to make use of the additional air thus blown into the combustion chamber, fuel that can be burned by it must be supplied to the cylinder by the charge from the carburetor. In other words, the charge supplied by the carburetor is rich in fuel, and when this charge is mixed with the additional air blown in or injected during the compression stroke, the proper conditions for efficient combustion are obtained.

The amount of air which is being blown into the combustion chamber through the nozzle 9 is said to amount to about 20 per cent of the amount of air normally in the cylinder charge, and this air is blown in under pressures of 150-175 lb. per sq. in. It is stated that the exact point of the cycle at which the air injection valve closes is of no great importance, since air injection ceases automatically when the combustion pressure exceeds the pressure of the compressed air.

As may be seen from the cross-sectional view, any spray of oil in the crankcase cannot strike the cylinder walls directly, since these walls are shut off

from the crankcase by the piston wall. Lubricant is carried to the cylinder wall, however, by the air which is compressed in the air-pump chamber and which is drawn through the crankcase, where it picks up some of the oil mist therein.

The claims made for this engine are that it develops a greater torque than a conventional engine of the same cylinder dimensions and that its fuel economy is higher. Performance curves published for a 4-cylinder 3 $\frac{7}{8}$ by 4 $\frac{1}{4}$ -in. automobile engine with 4.25 to 1 compression ratio show an output of 42 hp. at 2200 r.p.m. and a minimum fuel consumption of 0.58 lb. per hp.-hr.

Engines designed to operate on the Schwarz cycle have been run also on fuel oil, a distillate of 28-32 deg. Be. gravity and having an initial boiling point of 300 deg. F. It is claimed that with this fuel the specific consumption was as low as 0.52 lb. per hp.-hr. When using fuel oil it is necessary to use an additional element for starting from cold. This may be either a small auxiliary gasoline supply which is used for a short time while the engine is being brought up to normal working temperature, or an outside nebulizer in by-pass to the carburetor. This nebulizer is provided with a small electric heating unit, which is operated only during the starting period.

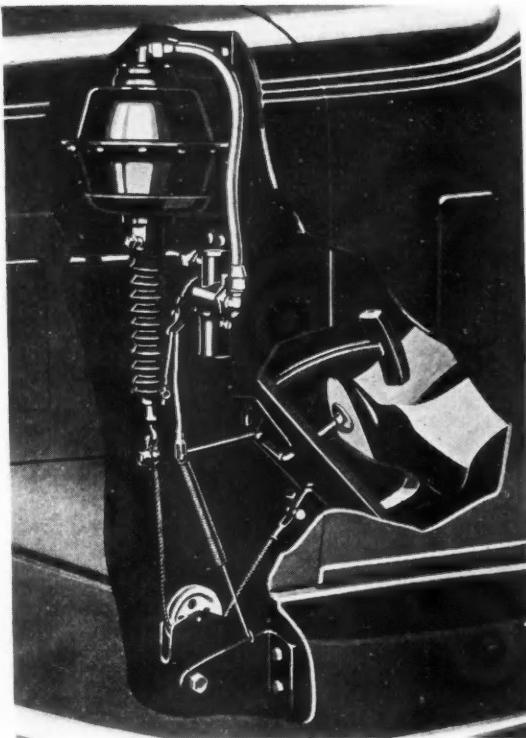
Durant Offers Two Lines for 1932

DURANT MOTORS is offering two lines for 1932, the 621 series, which is similar to the 612 line of last year, and the 622 series or Durant Special line. Both lines are equipped with the same improved six-cylinder 71 hp. engine which has a bore and stroke of 3 $\frac{1}{4}$ in. by 4 in. The 621 series has a wheelbase of 112 in., while that of the 622 series is 116 in. The 622 chassis, although it carries the same mechanical components as the 621, is a new job, having a double-drop frame and a longer wheelbase. The principal differences from last year's Durants are in the bodies and equipment. Both chassis models have tapering hoods and V-radiator fronts. The instrument panels are of new design. Standard equipment on the Durant Special includes two tail lights, a full chromium-plated radiator, an eight-day clock, double trumpet horns under the headlamps, bumpers and five wire wheels.

At an extra charge of \$100 the following special equipment is furnished with the Durant Special: Six wire wheels and six tires, tire covers, tire lock, startix, ride control, free wheeling, silent-second constant-mesh transmission and wiring for radio. The same extra equipment with the exception of wiring for radio is furnished with the 621 series of cars at \$115 extra, the greater charge in this case being explained by the fact that the 622 cars come regularly with five wire wheels, so that the additional equipment is less in their case.

The body models of the two series exhibited at the show with their prices are as follows:

Series 621	Series 622
Business coupe	\$550 De luxe coupe
Standard sedan	600 De luxe sedan
Roadster	645 De luxe brougham
Brougham	655



The control button of the Reo clutch is to the left of the pedal

Semi-Automatic Clutch Available on Reo Lines

sleeves, one within the other. The inner sleeve is operated by the control button, the outer by the movement of the diaphragm. When the two slots are in line, the vacuum of the manifold is communicated through half-inch tubing to the diaphragm chamber. Depressing the button first closes the air inlet and then brings the slot in the inner sleeve into line with that in the outer. As the suction moves the diaphragm, releasing the clutch, the movement causes the outer sleeve to turn through a slight angle. This movement throws the two slots out of line, cutting off communication between the manifold and the cylinder.

Unless the button is further depressed, resulting in again lining up the slots for further movement, clutch is held in the position then arrived at. In other words, the outer sleeve slot, actuated by the diaphragm itself, follows the inner sleeve to any position and holds the clutch in that position.

For clutch reengagement, the first thing that happens when the foot is lifted, letting the control button come back, is that the air inlet ports above the diaphragm are opened, permitting the diaphragm and clutch plate to return to the position representing beginning of engagement. Here slots in the two sleeves mentioned previously again come into action in the same manner as for disengagement, the diaphragm and clutch plate following up the movement of the inner sleeve as controlled by the foot button position. In this manner the rate of engagement can be varied, or partial engagement can be obtained.

The rapidity of movement, however, is limited by an adjustment limiting the maximum rate of engagement of air to the control cylinder or diaphragm chamber. This valve may be adjusted to suit the desire of the individual driver and to soften the clutch action whenever desired. In other words, this valve acts in the same manner as a door check.

It is to be understood, of course, that the clutch pedal can be used in the normal manner if desired, especially for traffic or parking conditions. Naturally the automatic clutch enables free wheeling at the will of the owner by merely depressing the clutch control button. The major point, however, is that it eliminated the high pedal pressure necessary to disengage the normal clutch every time gears are shifted or the car is brought to a stop.

Aside from the adoption of the clutch control mechanism, no major changes are to be found in the offerings of the Reo Motor Car Co. at the New York Show, according to information received from the factory. The aerodynamic line introduced last year on the Reo Royale, and later extended to the other Reo models, are of course continued, and are in line with changes made by the industry as a whole for 1932.

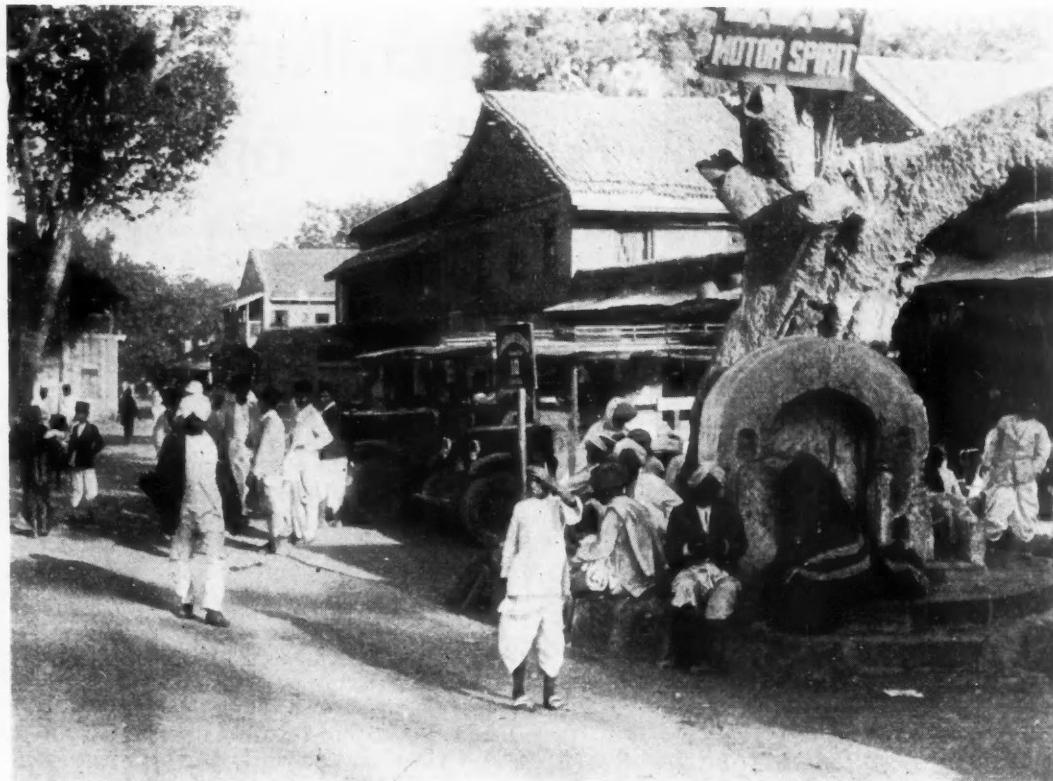
SEMI-AUTOMATIC clutches are announced by the Reo Motor Car Co. as standard equipment on the Royale lines, models 31, 35 and 52, and on the Flying Cloud model 25. They are available at slight extra cost on other Reo Flying Cloud models and are so designed that they may be applied to Reo cars now in service.

The Reo type of semi-automatic clutch differs from the usual type in that it is not controlled by the accelerator position but rather through a separate button located to the left and slightly below the clutch pedal proper. This control button thus in effect replaces the clutch pedal, although the latter is retained. Disengagement of the clutch is produced by depressing the button which opens a valve in a line from the clutch cylinder to the intake manifold. Releasing the button reengages the clutch. The valve mechanism is of such a design that the clutch follows the movement of the foot.

In effect, therefore, the semi-automatic clutch functions much as a vacuum booster in a braking system, relieving the driver of the load. Of course, the movement required for engagement and disengagement with the button is much less than that with the normal clutch pedal.

As may be noted from the accompanying photograph, the actuating cylinder is vertically mounted on the dash and operated by the clutch throwout mechanism through a cable and pulley arrangement. Operation does not affect the clutch pedal, the latter not being rigidly connected to the clutch throwout shaft.

As has been mentioned, the clutch "follows" the movement of the button. To provide this "follow up" action, the valve controlling communication between cylinder and intake manifold consists of two slotted



Consider India, Where the Bus Man's 'Prentice is Cock of the Village Walk

by Mohamed Ally Khan

Editor, Islamic Trade and Commerce

A REVOLUTION in India, as it appeared to be from England, took me to my country last summer after eight years' absence. The only revolution I discovered during my three months' stay was the rapidly growing habit of bus travel and commercial transport in almost all parts of India which I traveled during the period.

There was a time when motor vehicles could scarcely be seen beyond the boundaries of the presidency and district towns and the villagers in the remote countryside used to run in wonder from their farms and groves when a motor vehicle was noticed on the nearby road. It is common knowledge that in those days the local zemindar, buying a car, would drive it to the village owned by him and would then collect a tribute of one to five rupees per head for his car to be driven to the villagers' doors and shown to them.

Today these villagers have cultivated a habit of traveling daily in motor buses from villages to district towns. I happened to be in some of the far-distant villages in the United Provinces and Behar where rail

or road traffic was very difficult but I found regular motor services efficiently conducted there and enthusiastically patronized by the peasantry of those provinces.

One morning at a village motor stand it was a most interesting sight for me to see a simple-looking old peasant loaded with his inevitable bundle on his back being pulled by two rival motor bus owners for a vacant seat in their respective cars bound for town and his sheer disgust at the behavior. "I will go in a train rather," he exclaimed following the path to a railway station about two miles from the spot.

For commercial transport there are ordinary standard designs in use but motor buses have special designs with efficient bodies of 30 or 40 seating capacity and with separate inclosures for women traveling in purdah, just behind the driver's seat. These de-

signs are very cheap and built to meet the climatic requirements of the tropic land. The bodies are locally fitted on the chassis. They are painted in deep Oriental colors, speeding in their thousands over the highlands of the most fertile regions every day.

The cost of such vehicles, I was told by an owner, was from £200 to £250. It was difficult for one not in that trade to judge its value, but considering its locally built body, barely furnished and fitted with wooden seats, enormous profits ought to have been made out of it.

The reason for this flow of motor traffic in India during the recent years was attributed to the introduction of the hire purchase system which created considerable interest and having been most favorably received among the most backward peasantry which finds in it a new opening for the village youth.

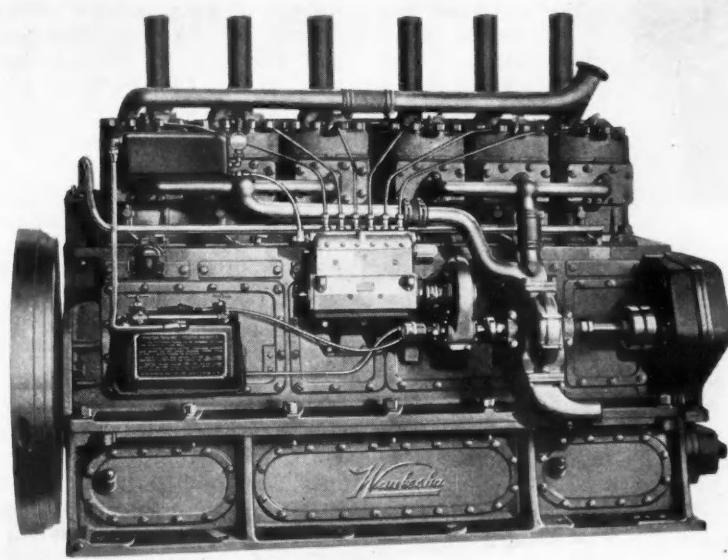
Every young lad I found was fighting hard to become a motor driver and as many as 4 or 5 were attached to every vehicle working for nothing, simply to learn how to drive. And they were encouraged by their parents in this enterprise with a promise of meeting the first instalment and a guarantee for the next eleven as soon as they got their license—a clear indication of the desire of the peasantry to create a profession for their grown-ups who are always idle for the better part of the year.

One of my English friends—a sales manager of an

American motor firm—quite unexpectedly met me while traveling in Oudh region. He told me that road transport has enormously developed in India during the period of unrest, and that motor traffic in peace time has a great future in this country. "The growth of motor transport in spite of revolution is a creditable fact," he added. Discussing the work in the local factories I learnt from him that they get the chassis from abroad and keep a representative selection of the coach built lorry bodies and directly the first instalment has been paid and the necessary inquiries satisfied, the body already selected by the buyer is mounted on the chassis and the car delivered within a week. Another safeguard is the local agent's responsibility for the payment of the next instalments, a system which was working to their entire satisfaction.

Unfortunately the trade is losing some of its attractions for want of better roads which have had no reconstruction for ages. A motor bus owner told me that after he has paid the last instalment, if not before, the bus is unworkable, leaving no chance of making any profit after a year of hard work on the roads. The firms have also begun to think that road difficulties and capital were the barriers in the still unexplored regions against adoption of motor transport.

Nevertheless there are great distances—areas of thousands of square miles—open to motor traffic and the field is inexhaustible for vehicles in that vast sub-continent of India.



Waukesha Exhibits 6-cyl. Diesel With Solid Injection

The engine (shown at left) develops 180-200 hp. and is based on earlier 4-cyl. type which appeared at last year's Road Show

AT the Twenty-ninth Annual Convention and Road Show which was held at the Municipal Airport in Detroit, the Waukesha Motor Co. exhibited a new six-cylinder Diesel engine of 180-200 hp. rating. It is a $7\frac{3}{4}$ by $8\frac{1}{2}$ engine and follows in all essentials the lines of the four-cylinder Diesel that was shown at the Road Show a year ago. It is a four-cycle, solid injection unit with Bosch injection pump and fuel system, a special compressed-air starting system, and the Waukesha L-head, high turbulence combustion chamber. Since engines of this type must be started by mechanical means, the gasoline auxiliary starting system that was shown

on the four-cylinder engine last year is of no practical advantage, and is omitted. This engine is complete with fuel, air and lubrication filters, and all of the necessary attachments for placing it in immediate operation.

In addition to this, two six-cylinder engines popular in the industrial field will be shown, with improvements that add to their output and economy. There will be shown also a new power unit in the 10-20 hp. range which completes the Waukesha line for the smaller industrial operations. This engine will be exhibited with enclosing house and power take-off.

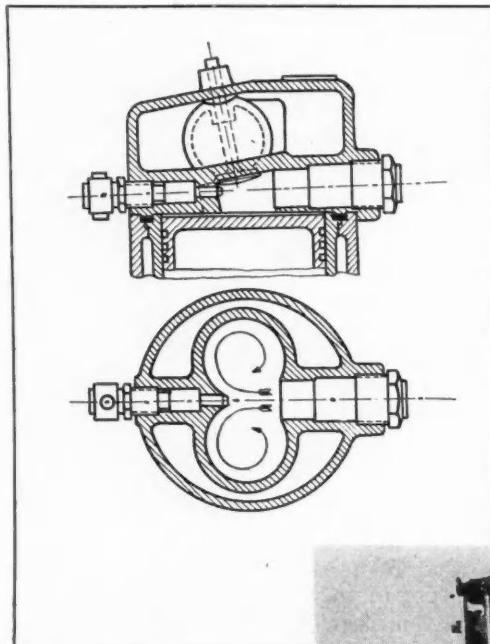


Fig. 1—Lanova cylinder head in vertical and horizontal section

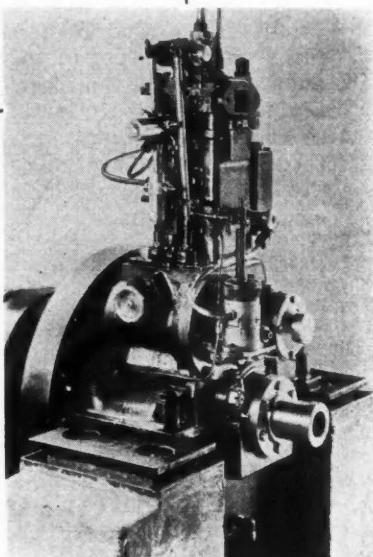


Fig. 2—Experimental single-cylinder Lanova engine

FRANZ LANG of Munich, originator of the Acro engine, has recently come forward with another new design of high-speed Diesel engine which is to be marketed under the name Lanova. It involves the feature of ordered air flow or turbulence and is claimed to operate at an unusually high b.m.e.p. and with a very low proportion of excess air.

A diagram of the combustion chamber, which is located in the cylinder head, is shown in Fig. 1. In plan view the combustion chamber is approximately heart-shaped. To one side of the combustion chamber proper there is an air storage chamber communicating with the former, and directly opposite the air storage chamber is located the spray nozzle. The operation of the engine is as follows:

At the end of the compression stroke there is a certain amount of air under pressure in the air storage chamber, and fuel is sprayed into the entrance to this chamber across a part of the combustion space. It is supposed that when the tip of the spray jet reaches the entrance to the air chamber it has been heated to such a degree that ignition takes place before the fuel enters the chamber itself. Since injection begins some time before dead center, the fuel will be already ignited when the piston starts on the expansion stroke. The air in the storage chamber now rushes out of that chamber in a direction directly opposite to the spray, thus helping to further

Lanova Diesel Engine Has Ordered Air-Flow

Claimed to operate with high b.m.e.p. and low proportion of excess air

atomize the fuel. Owing to the shape of the combustion chamber, the air will be caused to swirl therein by the discharge of the storage chamber. Two swirls are produced, which are tangent to each other at the axis of the fuel jet. Since the direction of these swirls is contrary to that of the jet, it is claimed that this brings practically all of the fuel particles in intimate contact with air, thus permitting of the combustion of a very high proportion of fuel to the air content of the combustion chamber. It is stated that in this way the air excess coefficient has been reduced to the very low figure of 1.10 under favorable circumstances.

Another advantage claimed for the Lanova engine is that its maximum combustion pressure is comparatively low. It uses a compression ratio of between 12 and 13 to 1 resulting in a compression pressure of from 380 to 440 lb. p. sq. in., and the cycle employed is closer to the constant-pressure than to the constant volume cycle. The pressure increase on ignition is said to be in the ratio of about 1 to 1.5, hence the maximum combustion pressure ranges between 540 and 630 lb. p. sq. in.

In addition to a high mean effective pressure the Lanova principle is said to make possible the use of high speeds. A single cylinder experimental engine has been built, with a bore of 2.95 in. and a stroke of 6.30 in. This was operated at 1400 r.p.m. corresponding to a piston speed of 1470 ft. p.m. High-speed gasoline engines are normally operated at piston speeds of 2100 ft. p.m., and it is believed that with multi-cylinder engines of the Lanova type this speed can be equaled.

Starting of the engine is effected by hand cranking or electric starter, without the use of any auxiliaries such as electric heating coils. This is made possible by the provision of a plug in the base of the air storage chamber by means of which the compression volume of the engine can be varied. By increasing the compression ratio to the limit provided for, the engine can be started directly even in very cold weather. The injection nozzle is of the single-orifice type and is hydraulically controlled. Comparatively low injection pressures (1150 to 1400 lb. p. sq. in.) are used. These low injection pressures are said to assure long life of the nozzle. Both the nozzle and the pump are new designs of Franz Lang, but details of these cannot be given at this time.

The experimental engine is direct-coupled to a direct-current generator of a capacity of 3.3 kw. at

1400 r.p.m. In a test made on this engine by Professor Dr. A. Loschge of Munich Technical College, it developed an actual output of 8.29 hp. at 1405 r.p.m., which, when corrected for atmospheric pressure and temperature (Munich has a high altitude), was equivalent to 8.86 hp. The actual m.e.p. was 107.9 lb. p. sq. in. and the corrected m.e.p., 115.2 lb. p. sq. in. The fuel consumption was 0.433 lb. p. b. hp-hr., the volumetric efficiency, 77.5 per cent, and the air excess figure, 1.125. In this test the large air chamber was used. A complete report of his tests on the Lanova engine was made by Dr. Loschge at the recent annual meeting of the German Society of Engineers, and we understand that the report will be published in a special Diesel Number of the *Zeitschrift des Vereines Deutscher Ingenieure* to be issued this month (December).

Russell Molded Brake Lining Exhibited in New York

RUSSELL MFG. CO., of Middletown, Conn., presented (at the Commodore Hotel) a new molded brake lining specially designed for use on the Tru-Stop brake of the American Cable Company. It is molded in quadrant form so that four pieces make a complete lining, and comes with holes drilled and countersunk, to correspond to holes in the brake shoe. The firm has been making such brake linings before, but those now shown are of a new composition which is said to be able to stand the heat better and to be longer lived.

The Excise-Tax Overload

(Continued from page 112)

ening the lower income tax brackets. The latter is, however, being strongly opposed as are the proposals for sales taxes.

There are many also who are opposed to raising as much additional revenue as the administration is seeking in order to curtail Treasury borrowing. Those who are opposed to sales taxes and higher taxes on smaller incomes generally favor the floating of bonds, though some feel that even higher rates than proposed should be assessed on the larger incomes. Such leaders as Speaker John N. Garner (Dem.), of the House; Senator Pat Harrison (Dem.), of Mississippi, and Senator Smoot, chairman of the Committee on Finance, which handles revenue legislation, favor higher taxes on the larger incomes. Senator Reed Smoot (Rep.), however, also has come out in favor of sales taxes of various kinds. Speaker Garner and Senator Harrison are strongly opposed to general sales taxes or the revival of any wartime nuisance taxes. Representative Isaac Bacharach, prominent Republican member of the Ways and Means Committee, favors "luxury" taxes and higher taxes on the larger incomes. He has not explained what he means by "luxury" taxes, however. Rarely has any member of Congress come out avowedly in favor of motor sales taxes. One prominent Senator, however, has gone on record urging such taxes. He is Senator Hiram Bingham (Rep.), Connecticut, a member of the Finance Committee.

Franklin Exhibits V-12 at New York

H. H. FRANKLIN MFG. CO. exhibited its new 12-cylinder model at New York, on the development of which the company's engineering department is said to have spent four years. The showing was of a preliminary nature and manufacturing operations on the new line are expected to begin early in March, hence the details available at this time are rather meager.

The engine naturally is of the V-type, with the two banks of cylinders making an angle of 60 deg. with each other. Bore and stroke are $3\frac{1}{4}$ by 4 in., giving a piston displacement of 398 cu. in. For a displacement volume of this magnitude the peak output of 150 hp. at 3100 r.p.m. is relatively high, which is no doubt to be accounted for by the use of the supercharging principle employed. As in the new six-cylinder model, air is forced into the engine cylinders by the blast from the cooling blower. The duct from the blower passes through the space between the two cylinder banks, and the cooling air is blown over the firmed cylinder walls and heads from the center of the engine compartment toward the sides. The fan is of larger diameter but the same width as on the six.

Lubrication of the engine is by force feed to all main and connecting rod bearings and to the timing gear from a double gear pump. Connecting rod heads are provided with bleeder holes for additional lubrication to the cylinder walls. The engine oil reservoir holds 10 qt. An oil filter is included in the equipment.

The crankcase is an aluminum alloy casting, while the oil pan is a steel pressing.

The crankshaft has seven main bearings and is fully counterbalanced. Pistons are of aluminum alloy with invar steel struts. Piston pins are case-hardened and chromium plated. Connecting rods are of the conventional I-section type. Each piston carries four rings. Cylinders are individually cast, with integral cooling fins. Cylinder heads also are cast individually, of aluminum alloy, with integral cooling flanges, and each head is secured to its cylinder by six bolts. The valves are located in the cylinder heads and the valve mechanism on top of the cylinder heads is inclosed and automatically lubricated. Camshaft and generator are driven by a toothed chain. The blower of the cooling system has its rotor mounted directly on the crankshaft. The carburetor is of Stromberg manufacture and equipped with Franklin attachments, an air cleaner and a fuel vaporizer. The entire electrical system, including generator, starter and ignition unit, is of Delco-Remy manufacture.

Power is transmitted through a single-plate clutch and a three-speed transmission with silent second gear, synchronizing clutches and free-wheeling unit. The car has a wheelbase of 140 in. Ride control is included in the equipment.

See *Automotive Industries*, Jan. 16, 1932, page 86.

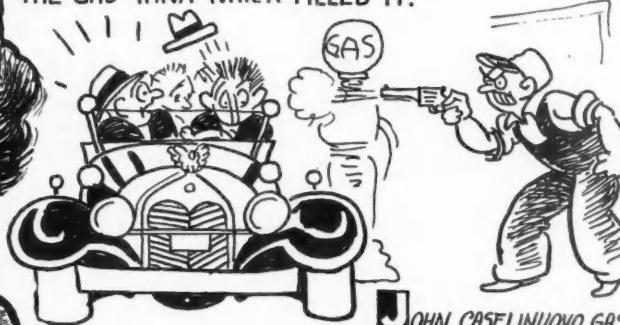
Automotive Oddities—By Pete Keenan

CAPTAIN SAMUEL MOREY NOT ONLY INVENTED THE INTERNAL COMBUSTION ENGINE. BUT ALSO THE FIRST STEAM BOAT.

According to Chas. E. Duryea.



THERE WAS A ZEPPELIN DESIGNED TO TAKE OFF FROM THE GAS-TANK WHICH FILLED IT.



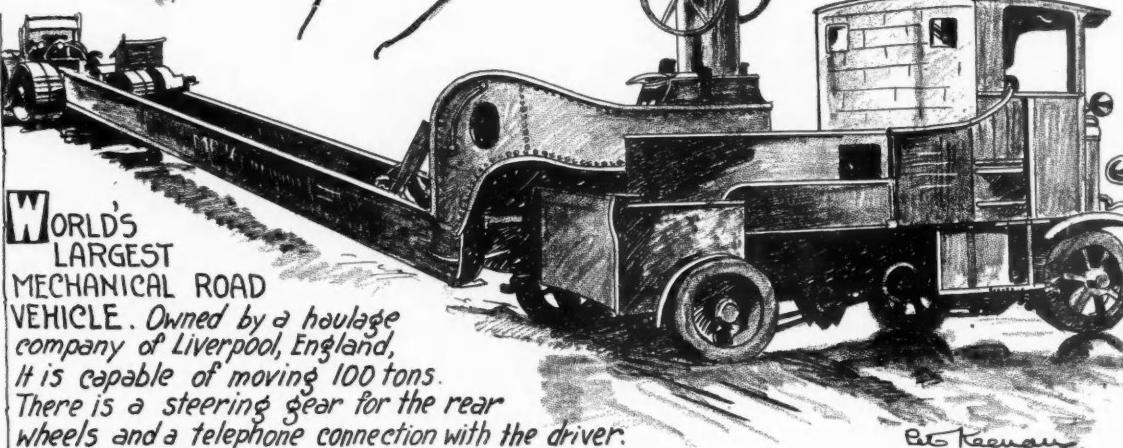
AL SPEED RAN OVER R. SLOW A PEDESTRIAN.

Chicago, June 1930.

JOHN CASELNUOVO GAS STATION MAN OF BUFFALO, WAS ANNOYED BY AN IMPATIENT YOUTH BLOWING HIS HORN FOR SERVICE; SO HE SHOT THE YOUTH.

Aug. 1931.

Pete Keenan

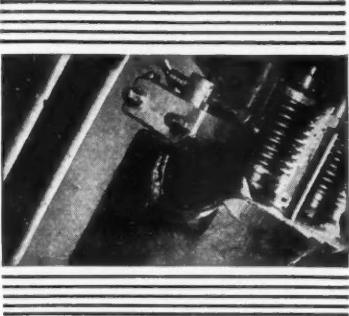


WORLD'S LARGEST MECHANICAL ROAD VEHICLE. Owned by a haulage company of Liverpool, England, it is capable of moving 100 tons. There is a steering gear for the rear wheels and a telephone connection with the driver.

Pete Keenan

Do You Know An "Oddity"?

Correspondence about "Automotive Oddities" is invited. Contributions used will receive editorial mention when practicable. If you are interested in the source of, or the reason for, a particular "Oddity," ask the editorial department of Automotive Industries about it.



NEWS OF THE INDUSTRY



Reeves Deplores Excise Tax Move

Address Features
Brooklyn Show

NEW YORK, Jan. 18—Alfred Reeves, vice-president and general manager of the National Automobile Chamber of Commerce, spoke over the radio yesterday as part of the promotional program of the Brooklyn automobile show being held this week.

After commenting enthusiastically upon the results of the New York show and the possibilities of follow-up through the local shows, such as the Brooklyn show, Mr. Reeves deplored present tendencies toward increasing the tax burden of the automobilist, especially as threatened in the move toward the Federal excise tax.

Baldwin Rubber Elects Wilson and Young

Baldwin Rubber Co., Pontiac, has elected the following directors: C. B. Wilson, formerly president of Wilson Foundry and Machine Co., Du Bois Young, president of Hupp. F. L. Given, Samuel G. Clark, Harry M. Pryale and C. B. Myers were reelected. Mr. Clark was renamed president and Messrs. Myers and Pryale were elected vice-presidents. C. B. Wilson was elected secretary and treasurer and N. B. Eldred, Jr., was named assistant secretary and treasurer. A proposal to establish a Canadian plant was tabled indefinitely, owing to present conditions.

Nash Names Moore as Chief Engineer

Announcement of the appointment of Mead F. Moore as chief engineer of the Racine division of the Nash Motors Co. has been made by C. W. Nash.

Automotive Industries

BILLY ARNOLD has already entered a Hartz-owned car in the 1932 Indianapolis Memorial Day racing classic.

The first bomb tossed in Chicago in 1932 was set off in a garage—the F. & J. Auto Garage, 1330 S. Ashland Ave. Labor trouble.

"Teddy" Webb, Chicago's first automobile bandit, serving a life sentence in Joliet for the murder of a Chicago policeman, has filed a petition for clemency.

Segal Lock & Hardware Co. and Vesta Battery Corp. have taken their stock off the Chicago Stock Exchange, discontinuing their Chicago transfer agents and registries.

A dirigible hangar to house the Goodyear blimp during the World's Fair in Chicago in 1933 will be started immediately following a deal between Palwaukee airport and Goodyear. A collapsible mooring mast is proposed for the lake front. Other developments in the World's Fair which indicate the prominent part automobiles and the automotive industry will play include: Signing of a contract for space by the International Harvester Corp., which will trace the history of farm machinery in a dramatic display; payment in full by the Borg-Warner Corp. for space in which to exhibit its whole line of products; a deal closed with Norge Corp.

Revamped Ford Four May Precede Announcement of Eight

DETROIT, Jan. 21—While the Ford Motor Co. has reserved space at the Detroit Automobile Show Saturday (Jan. 23) for passenger cars as well as commercial vehicles, factory officials up to Wednesday expressed doubt that passenger cars would be exhibited. Further releases during early January to parts manufacturers for four-cylinder engine parts indicate the possibility that a revamped and possibly lower-priced four may precede the new eight in announcement date.

It will be recalled that *Automotive Industries* forecast the possibility of a four at lower prices on Dec. 19, at which time plans for the new eight were discussed.

Parts manufacturers, generally, are more in the dark than ever now as to what Ford will decide eventually to do. Consensus of opinion, however, is that further investigation disclosed the necessity of pricing the eight higher than contemplated last month, so that a cheaper car was found necessary to maintain Ford's position in the lowest price bracket.

New Bills Menace Truck Operations

House and Senate
Get Several Measures

WASHINGTON, Jan. 14—Senator Couzens, of Michigan, chairman of the Committee on Interstate Commerce Commission, has introduced a revised form of the Parker motor bus bill, but has broadened it so as to include motor trucks for interstate commerce regulation, while in the House, Representative Huddleston, of Alabama, has introduced a measure similar to that offered by Senator Couzens, and Representative Boland, of Pennsylvania has introduced a bill to tax motor buses and trucks engaged in Interstate Commerce.

Senator Couzens announced full hearings would be held on motor bus and truck bill which provides for Interstate Commerce Commission control. This is also true of the Huddleston bill, the Federal Commission to confer with joint boards of states affected by motor operation through not more than three states. The Couzens and Huddleston bills carry no rate-making provisions. Senator Couzens said this feature was omitted for the present in order to develop the railroad point of view. The bill includes a proposed study of effects of contemplated railroad consolidations and provides for full control of all holding companies of bus and motor as well as rail lines, the issuance of certificates of public convenience, and other proposals which the old Parker bill provided.

The Boland bill contemplates a tax of 2 cents a mile on each truck with a capacity of $1\frac{1}{2}$ tons or less and 3 cents a mile on trucks of greater capacity. On buses, the bill provides a tax of 2 cents a mile for each bus with a seating capacity of 10 passengers or less and 3 cents a mile on those of more than 10-passenger capacity. So far as consistent, the general provisions of the internal revenue law would be applicable.

January 23, 1932

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Jan. 20—The unusually warm weather in some sections of the country retarded retail trade in seasonal goods last week. General business was quiet. The improvement in the stock and bond market last week, the strength in the grain markets, and the better demand for cotton both at home and abroad are encouraging.

CAR LOADINGS

Railway freight loadings during the week ended Jan. 2 totaled 503,325 cars, which marks an increase of 61,736 cars above those during the preceding week, but a decrease of 111,535 cars below those a year ago and a decrease of 272,430 cars below those two years ago.

COMMERCIAL FAILURES

Commercial failures in the United States during December, according to R. G. Dun & Co., numbered 2758, as against 2195 during November and 2525 a year ago. Liabilities involved in the December failures totaled \$73,212,950, as against \$60,659,612 in the preceding month and \$83,683,361 a year ago.

COTTON CONSUMPTION

Cotton consumed in the United States during December amounted to 460,008 bales, including linters, as against 481,557 bales during November and 449,040 a year ago. Production of cotton cloth during December, according to the Association of Cotton Textile Merchants of New York, amounted to 254,692,000 yards, which marks a decrease of 12 per cent below that during November.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Jan. 16 stood at 65.2, as against 65.3 the week before and 66.7 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City during the week ended Jan. 13 were 23 per cent below those in the corresponding week last year.

STOCK MARKET

The stock market last week continued to display strength under the leadership of the railway issues, whose rise is based on the belief that the negotiations regarding the 10 per cent reduction in railway wages will be successful. The bond market last week also displayed strength, and bond prices have advanced appreciably since the beginning of the year. The volume of trading on the stock market increased last week, and prices for that period showed general advances.

RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Jan. 13 showed decreases of \$61,000,000 in holdings of bills bought in the open market and of \$13,000,000 in holdings of Government securities. Holdings of discounted bills remained unchanged. The reserve ratio on Jan. 13 was 66.9 per cent, as against 65.5 per cent a week earlier and 61.9 per cent two weeks earlier.

Crude Rubber Imports Gain During December

NEW YORK, Jan. 19—Imports of crude rubber for December amounted to 51,931 long tons, the highest for any one month since April, 1929. December arrivals were 18.7 per cent greater than November this year and 48.8 per cent above December a year ago, according to statistics released by the Rubber Mfrs. Association today.

Consumption of crude rubber by manufacturers in the United States for the month of December amounted to 21,409 long tons, making a total for the year of 348,986 long tons, as compared with 375,980 long tons for 1930. The December consumption shows a decrease of 6.7 per cent as compared with November, although the seasonal decline for the previous five years for December under November has been 8.7 per cent.

The association estimates total domestic stocks of crude rubber on hand December 31 at 322,826 long tons, an increase of 10.4 per cent over November this year, and 60.6 per cent over December 31, 1930.

Crude rubber afloat for the United States ports on Dec. 31 is estimated at 53,940 long tons as against 77,443 long tons on Nov. 30 this year, and 56,035 long tons on Dec. 31, 1930.

Walter Organizes Canadian Company

TORONTO, ONT., Jan. 16—The Toronto Industrial Commission announces that Walter tractor trucks and "snow fighters," extensively used in Canada, are to be manufactured here. The Walter Motor Truck Co., Inc., of Long Island City, N. Y., have formed a new Canadian subsidiary under an Ontario charter, Walter Motor Trucks of Canada, Ltd.

Willys Prices Reduced

TOLEDO, Jan. 19—Flat reduction of \$100 in list prices of all new 1932 Willys-Overland sixes and eights and Willys-Knight models was announced effective immediately by L. A. Miller, president.

Reduction "squarely meets the present recognized economic situation" and will increase dealer profits by building volume sales and also stimulate employment and material purchases, he said.

Willys-Overland six prices start at \$415 and range to the 4-door sedan at \$595. Eight price ranges from \$695 to \$795. The Willys-Knight six is \$795 and up.

Allis Buys Ryan Mfg. Co.

MILWAUKEE, Jan. 18—The Allis-Chalmers Mfg. Co. has become a full line tractor road machinery manufacturer as the result of the purchase of the complete line of grading machinery made by the Ryan Mfg. Corp.,

Chicago, in a cash deal closed during the past week. The Ryan line will be transferred to LaPorte, Ind., where it will occupy part of the Advance-Rumely division works. First deliveries will be made about Feb. 1. The Ryan Corp. is a subsidiary of the Ryan Car Co., manufacturer of railroad rolling stock, forgings, etc., with two plants at Hegeswick, Ill., south of Chicago. Ryan grader plant personnel will be employed by Allis-Chalmers.

Canadian Rubber Imports are Off

TORONTO, ONT., Jan. 16—Shrinkage of rubber manufacturing in Canada during 1931 has been chiefly due to drastic curtailment of exports and to reduced sales to motor car manufacturers whose production decreased by about 46 per cent.

The customs records of imports of crude rubber for the past 10 years are as follows:

Crude Rubber Imports

	Total Lb.	Value \$
1921	18,476,290	3,598,386
1922	21,075,630	3,548,273
1923	29,695,626	8,713,209
1924	32,893,840	8,199,734
1925	44,407,421	25,810,949
1926	45,312,477	24,926,556
1927	59,145,951	22,623,511
1928	69,197,385	18,035,338
1929	79,407,944	17,107,408
1930	64,491,959	8,681,743
1931 11 mos.	51,089,303	3,742,127

The 11 months' figures for 1930 and 1931 show a decrease in production of 772,700 tires, or 25 per cent. Sales to car manufacturers dropped 303,400, or 44 per cent, although there was a slight improvement in sales to tire dealers, who took nearly 1,500,000 castings for road distribution. These factors, together with the big decline in export sales, accounted for a reduced shipment from factories of about 800,000 units, or 24 per cent.

Canadian Firestone Increases Employment

HAMILTON, ONT., Jan. 16—Firestone Tire & Rubber Co. of Canada, Ltd., announced a full staff of employees will work on a five-day weekly schedule for the remainder of the winter. The officials have also decided to operate the plant eight hours per day instead of six, as at present. More than 500 employees are affected.

Goodyear of Canada Earned its Dividend

NEW TORONTO, ONT., Jan. 16—The Goodyear Tire & Rubber Co. of Canada, Ltd., earned its dividends in full last year and added to surplus, after setting up liberal reserves for depreciation, inventories, accounts receivable, and depreciation in investment in Canadian government bonds, according to a statement to shareholders by C. H. Carlisle, president and general manager. No bonus payment was made on the common stock.

Rhodium Plating Process Offered

NEWARK, N. J., Jan. 19—Rhodium plating is one of the latest industrial processes and so far is used mainly for plating jewelry. There is a possibility, however, that it may find application in fields outside the jewelry industry. Rhodium, one of the precious metals, is not unknown to automotive engineers, as it was formerly used alloyed with platinum for interrupter points. Rhodium plate imparts a permanently white, hard, non-tarnishing plate to the articles plated with it.

A process of rhodium plating and a solution for use with same are being offered the industry by the H. A. Wilson Co. The Wilco process is said to be simple to operate, one of its advantages being that it is not accompanied by gassing. It can be applied to all precious metals, even with stones set, and to all base metals except iron and alloys containing more than 10 per cent of zinc. Sterling silver can be rhodium-plated without the application of under coats of nickel or palladium. With Wilco solution a good coat of rhodium is said to be obtained in 30 seconds or less.

J. P. Seiberling Named

Seiberling Rubber Co. has appointed J. Penfield Seiberling as sales manager. Mr. Seiberling for the past year has been a director and assistant to the president, F. A. Seiberling. He was formerly vice-president in charge of sales of the Lambert Tire & Rubber Co., and was at one time affiliated with Goodyear Tire & Rubber Co., under I. R. Bailey, assistant sales manager. H. L. Post will remain with the company as assistant to the president.

Carbon Black Output Off

AMARILLO, TEX., Jan. 18—Production of carbon black in the Panhandle district of Texas during 1931 totaled approximately 60,000 tons, or more than one-half of the world's output, as compared with about 90,000 tons in 1930, according to H. W. Huber, vice-president of the Huber Petroleum Co., a large manufacturer of the product. He said that the industry is in good condition and that the demand for carbon black in the manufacture of tires and other purposes promises to show an increase this year.

Newark Show Success

NEWARK, N. J., Jan. 22—With a 40 per cent attendance increase for the first three nights, over the same period last year, the twenty-fifth Newark automobile show, the exposition has established itself as an outstanding success.

Factory executives, visitors to the show in large numbers, are enthusiastic over the buying power displayed.

The Tuesday night attendance, brought to the show in cars bearing license tags of virtually every county in the state, was the largest Tuesday night turnout on record. The show committee and everyone concerned with the display and with the motor industry is stimulated to the highest optimism by the tremendous public interest and robust buying power displayed.

The show will close Saturday night, Jan. 23, with attendance experts already predicting that its total number of visitors will prove the greatest in the history of the Newark expositions, with sales in proportion.

Joint Show Date Set

NEW YORK, Jan. 18—The third joint Motor and Equipment Manufacturers' Association and National Standard Parts Association Trade Show will be held during the week of Dec. 5. While the place of the show has not yet been definitely determined, it will probably be either Detroit or Cleveland.

Bentley May Go

LONDON, Jan. 7 (*by mail*)—The acquisition of Bentley Motor by Rolls-Royce (reported in *Automotive Industries*, Dec. 12) may lead to the extinction of the Bentley. At least, it seems clear that Rolls-Royce intend that the most recent Bentley model, the 8-litre, shall no longer compete with the famous Rolls-Royce 40-50 hp. model. A joint offer was made by two firms of London dealers to take over at a very reduced figure the entire manufactured stock of the 8-litre line, together with a certain number of the two other current models now lying at the Bentley works. By arrangement with Rolls-Royce, Ltd., these cars are now being offered to the public at a discount of from approximately 35 to 47 per cent.

It would seem, therefore, as though Bentleys had been acquired with a deliberate view to its extinction. The registration of a new company, Bentley Motors (1931), with a capital of £100,000, as a subsidiary of Rolls-Royce does not necessarily mean that Bentley business will be continued. There is, on the other hand, a rumor that Rolls-Royce will themselves enter the sports car market, in which Bentley first made their name. Sir Henry Royce has never designed a sports car hitherto.

Perhaps greater importance should be attached to the future of W. O. Bentley, the designer of the cars that carry his name, than to the future of the company that manufactured and marketed them. No information is at present available regarding either Mr. Bentley or Capt. Woolf Barnato, who has been so largely responsible for making the reputation of the Bentley on the race-track and who so long supported its production with his private fortune.

Steel Orders Up Slightly

Improvement Noted in Commitments for Alloy Specifications

NEW YORK, Jan. 21—A moderate

increase in orders from motor car manufacturers as well as parts makers is reported by the steel industry. Strip mills have been able to broaden their operations slightly while some of the Mahoning Valley sheet rollers are marking time until a sufficient quota of orders has accumulated to make operations more profitable. Automotive orders for steel bars and miscellaneous descriptions of steel have enabled the leading interests to step up ingot production at one of its Ohio mills to 50 per cent of capacity. Improvement is noted in commitments for automotive alloy steels.

Competitive conditions in the steel market, if changed at all, have become keener than they were. In 1931, some 4,000,000 tons were added to steel-making capacity and the advantages accruing to producers from this or that short cut in manufacturing are reflected in the scramble for orders for certain products. The market for full-finished automobile sheets is generally quoted at 2.90 cents, with hints that some business has been done at \$2 a ton below that level. This represents a decline of approximately 55 per cent from the prices that were in effect in 1927. Strip-steel prices are but little changed and certainly not stronger. Automotive demand for wire products is more active. There has also been some buying of bolts and nuts. More activity in a number of the steel scrap markets is taken to indicate better demand for steel-making materials, but new lows were recorded in some of the transactions, sales of heavy melting steel at \$7 being reported in Chicago.

Pig Iron—Releases for shipments to Ford as well as Chevrolet foundries are reported by Western blast furnace interests and January shipments are running 15 to 20 per cent ahead of December. In the Chicago market foundry and malleable iron continue to be quoted at \$16.50, with occasional concessions granted on especially attractive tonnages. In the Cleveland market \$16 continues to be quoted.

Aluminum—The sole domestic producer in appraising the outlook for 1932 points to the steadily growing use of aluminum in motor truck bodies as one of the sources from which increased demand is certain to result. The market is unchanged and of a strictly routine character.

Copper—Dull and unchanged.

Tin—The market continues chiefly under the influence of the European political situation and the resulting fluctuations in the value of the English pound. Straits tin was quoted at the week's beginning at 22½ cents.

Lead—Quiet and unchanged.

Zinc—Dull and easy.

Men of the Industry and What They Are Doing

Graham, Frazer On Dealer Program

Robert C. Graham, vice-president of Graham-Paige Motors Corp., and J. W. Frazer, general sales manager of Chrysler Sales Corp., will speak at the afternoon program of the Michigan Automotive Trade Association convention, Hotel Statler, Detroit, Jan. 27.

Mr. Graham's subject will be "Trends of Our Industry," and Mr. Frazer will speak on "The Dealer Picture for 1932."

Hutto Names Directors

Directors of the Hutto Engineering Co., Inc., unanimously elected the following officers at their regular meeting, held in Detroit, Dec. 21: H. P. Kirchner, president; R. A. Jacobs, vice-president; J. A. Carlin, vice-president and general manager; R. H. Lansburgh, secretary and treasurer, and V. M. Laine, assistant secretary and treasurer.

FWD Names Gray

J. R. Gray has been appointed district sales manager of the Four Wheel Drive Auto Co., Clintonville, Wis., in charge of eastern Pennsylvania and southern New Jersey territory. He joined the FWD organization in 1918 and during the past three years has been in charge of sales in southwestern Wisconsin, with headquarters at Madison. He is succeeded in that territory by J. J. Kingston.

Murray Names Manser

Murray Rubber Co. announces the appointment of John Manser, of Lexington, Ky., as agent to cover the Kentucky and Indiana territory. He takes the place of Samuel Sherill, resigned. The company was closed down for three weeks to allow an inventory to be taken, and is now running to normal capacity again.

Sparta Names Keller

Sparta Foundry Co. has announced that L. A. Keller has been appointed secretary-treasurer, succeeding I. E. McGowan, resigned, and H. G. Vaughan has been appointed general manager, succeeding T. E. McFall, resigned.

Richard Stresau

Richard Stresau, of the A. O. Smith Corp. engineering staff, Milwaukee, and one of the best known electrical engineers in the country, died of heart disease at his desk on Jan. 13. He was 51 years of age and had been associated with the Smith Corp. since 1919. He is credited with the principal part of the developments of the

Smith processes of electrical welding, which are applied in the automatic manufacture of pressed steel frames, oil and gas line pipe, oil refinery pressure vessels, etc. Mr. Stresau was graduated from the Massachusetts Institute of Technology in 1900 and did considerable research work abroad prior to the World War, during which he undertook important engineering work for the U. S. Government.

Jahnke Leaves Fairbanks

Charles B. Jahnke, director of engineering, Fairbanks, Morse & Co., Beloit, Wis., has resigned to form new connections, the nature of which is withheld for the present. Mr. Jahnke joined Fairbanks-Morse in 1910 shortly after his graduation as a mechanical engineer from the University of Cincinnati. In 1922 he was appointed chief engineer of the main works in Beloit, and in 1924 general manager of these works. Two years later he was placed in charge of all engineering, his headquarters remaining in Beloit. Mr. Jahnke is a former vice-president of the S.A.E. He is especially well-known for his development of the Diesel engine. In 1928 and again in 1930 he spent several months in Europe studying Diesel engine industries.

Canadians Elect Grossman

D. R. Grossman, vice-president of Studebaker Corp. of Canada, Ltd., has been reelected as president of the Canadian Automobile Chamber of Commerce. T. A. Russell, president of Willys-Overland, Ltd., Toronto, was elected as vice-president, and J. C. Fraser, of Chrysler Corp. of Canada, Ltd., Windsor, as secretary.

Tipper Opens Consulting Office

Harry Tipper, for the past six years vice-president and general sales manager of General Motors Export Co., and formerly manager of *Automotive Industries*, has resigned from General Motors to become a consultant on distribution, merchandising, and advertising, with offices in New York.

Mr. Tipper has been intimately connected with many important movements for the improvement of advertising and merchandising. He is a former president of the Association of National Advertisers, former president of the Technical Publicity Association, former chairman of the Educational Committee of the Associated Advertising Clubs of the World. He was the organizer, with Professor Hotchkiss, of the New York University School of Marketing and served

as a member of the New York University faculty.

He is the author of several books, including "Human Factors in Industry," "Discussions on Labor," "The New Business," "Advertising, Its Principles and Practices," and "Advertising Campaigns." He has spoken widely and written many articles upon economic, business and labor subjects.

Reciprocal Tariffs Needed, Says Bauer

N.A.C.C. Export Head Asks "Give and Take" Arrangements

NEW YORK, Jan. 18—George F. Bauer, manager of the Export Division, National Automobile Chamber of Commerce, told the members and guests of the Overseas Automotive Club that before international trade could be reestablished on its former basis, a certain amount of "give and take" in tariff agreements would be necessary between nations.

This would provide for a freer interchange of commodities between nations without the actual shipments of gold to offset trade balances which at present has gone to the extent of making it impossible for many nations to buy from the United States, he said.

Representatives of the Department of Commerce from various parts of the world told of automotive market conditions in the various areas they represented. With the exception of the Scandinavian countries, the outlook for the immediate future is somewhat depressed by the low prices of products grown and made abroad. Automobiles are in use, creating a growing market for parts and vehicles.

Willys Is Speaker At W-O Anniversary

NEW YORK, Jan. 18—The Hon. John N. Willys, U. S. Ambassador to Poland, spoke last week at the Silver Anniversary dealer meeting of the Willys-Overland Co. About 900 dealers and salesmen were present.

N. A. Beardsley, sales manager of the company, acted as master of ceremonies and introduced H. B. Harper, vice-president in charge of sales, and L. A. Miller, president of the company.

Mr. Harper said the use and wear of automobiles demonstrates that purchase of new cars would become absolutely necessary this year. He said sales this year should be at least 25 per cent ahead of 1931.

Gets Dardelet License

NEW YORK, Jan. 18—Reed & Prince Mfg. Co., Worcester, Mass., has been licensed by the Dardelet Threadlock Corp. to manufacture and sell bolts, nuts, and screws threaded with the Dardelet self-locking thread.

Lock Washer Standards Proposed for Approval

A proposed American tentative standard for lock washers has been released by the subcommittee which developed it, to industry for general criticism and comment. This proposed standard was developed by a subcommittee of the sectional committee on the standardization of plain and lock washers organized in 1926 under the procedure of the American Standards Association and sponsored by the American Society of Mechanical Engineers and the Society of Automotive Engineers.

Those desiring an opportunity to examine a copy of this proposed standard may obtain a copy by addressing their request to C. B. LePage, assistant secretary, A.S.M.E., 29 W. Thirty-ninth St., New York, N. Y.

Defiance Progresses

TOLEDO, Jan. 19—Willard I. Webb, mine operator and capitalist, has been added to the board of directors of the Defiance Spark Plug Corp., it was announced today following the annual meeting of stockholders. The company earned in 1931 \$2.03 a share, against 84 cents a share in 1930 on its 67,132 shares no-par common stock. Initial dividend of 25 cents a share was paid in December.

Balance sheet as of Nov. 30, 1931, showed \$701,682 current assets against \$127,275 current liabilities. Surplus and capital is \$876,514. Total assets, \$1,003,790. Company has considerably enlarged its export business in 1931, President Raymond P. Lipe reported.

Develops Vapor "Unlock"

A device designed to prevent trouble from vapor lock in the fuel lines of automobiles, known as Vapor Unlock, has been placed on the market by Craveroiler Company of Philadelphia. It is inserted into the fuel line directly ahead of the carburetor and is said to permit the escape to the atmosphere of any gasoline vapor that may form in the line in the same way as vapor in hot-water house-heating systems is allowed to escape. The device is in the form of a small cylindrical tank, the fuel entering at one side near the top and leaving at the bottom, while the vapor escapes through a vent hole at the top.

Evans Buys Patents

DETROIT, Jan. 18—Patents and manufacturing rights on Everlevel strip type block flooring have been purchased by the Evans Products Company of Detroit, from Portland Spar Company, Portland, Oregon, according to an announcement by E. S. Evans, president of Evans Products.

Depicts Rubber Struggle

NEW YORK, Jan. 20—"The World's Struggle With Rubber," written by

James C. Lawrence, dean of the University of Minnesota, and published by Harper Bros., is a new book dealing with the history of the rubber industry. It covers the period of rapid expansion, the British attempt at control of production, and the subsequent debacle. It also takes a look into the future and foresees the time when American-owned plantations will establish a national self-sufficiency of rubber supply.

Heavy Schedules on New Hone

TOLEDO, Jan. 19—Hall Mfg. Co., is working on 24-hour basis to turn out new honing machine designed for finishing new type of hard metal valve seat inserts for manufacturers and service shops. The machine was developed about two years ago but was in advance of developments in the industry, according to Ernest A. Hall, president.

G. M. Fleet Sales Up

NEW YORK, Jan. 18—General Motors Fleet Sales Corp., a General Motors subsidiary organized to serve large national fleet users, sold more General Motors products during the three month period of September, October and November in 1931 than they did during the same period of 1930, according to C. E. Dawson, President. Total sales for the first 11 months of last year were 1 per cent under that of the same period of 1930.

Using Cuno Filter

NEW YORK, Jan. 18—Cuno Auto-Klean filter has been adopted as standard equipment on the Cadillac 12 and 16 jobs. This is also used on the Cunningham, on Reo trucks, and on the DO-X airplane. In this filter the cartridge is connected with a spring ratchet and rod to the clutch pedal, which makes the cleaning of the filter automatic. This is manufactured by the Cuno Engineering Corp.

C. M. Keys Retires

C. M. Keys, chairman of the Executive Committee of Curtiss-Wright Corp., and actively identified with Curtiss for a number of years, as well as other aeronautical developments, has announced his temporary retirement from the active management of these companies. His health and pressure of other business are given as the reasons for this temporary retirement, and he expresses the hope of resuming some of these activities at a later date.

Using Magazine Orders

NEW YORK, Jan. 18—Myers Magazine Oiling System, manufactured by the Chassis Lubricating Co. of Rahway, N. J., has been adopted as standard equipment on both the Walker and Ward electric trucks.

Railroad Plans Wider Truck Use

Store Door Delivery in New York Seen as Part of Consolidation

WASHINGTON, Jan. 18—Pleading for adoption of the Eastern railroads' plan for a consolidation into four rather than the Interstate Commerce Commission suggestion for five systems, M. W. Clement, operations vice-president of the Pennsylvania Railroad explained at recent hearings that the four-system plan contemplates an extensive store door delivery freight service in New York City to meet motor competition. The service will cover both carload and less-than-carload freight. The hearings will be resumed Feb. 15 when opponents to the railroad four-system plan will be heard.

Mr. Clement said that since the organization of the consolidation question 10 years ago, truck competition has grown from minor importance to major importance, giving complete delivery from the factory door to the store door. The railroads, to meet this competition, he said, are going to have to do likewise.

"The carriers are practically in agreement as to store-door delivery in New York," said Mr. Clement. "I predict that what happens in carload traffic will eventually come to less-than-carload traffic and what happens in New York will happen throughout Trunk Line territory."

"The fewer the carriers, the stronger the carriers, the more nearly equal are their conditions in the larger cities, the cheaper and more economically and more efficiently will store door delivery be worked out. The more efficiently and more economically that store door delivery is worked out, the greater the public benefit."

Chicago Salon Entries

NEW YORK, Jan. 18—Motor cars to be exhibited at the Chicago Salon, opening Jan. 30, are: Cadillac, Chrysler Imperial, Duesenberg, Lincoln, Marmon, Minerva, Packard, Pierce-Arrow, Rolls-Royce and Stutz. Custom coachmakers who have already entered special exhibits are: Brewster, Brunn, Dietrich, Fleetwood, Hayes, Le Baron, Murphy, Packard, Waterhouse, Weymann and Willoughby.

Muncie Reports Loss

CHICAGO, Jan. 18—Muncie Gear Company reports net loss of \$93,038 for 1931 after expenses, depreciation, interest and all other deductions. This compares with a net loss of \$35,013 in 1930.

Fluctuation of Automotive Securities on the New York Exchange Month of December

(From the January Bulletin of the New York Stock Exchange)

NAME OF GROUP	No. of Companies	No. of Issues	COMMON STOCKS			PREFERRED STOCKS			ALL STOCKS		
			Average Price	Total Shares Listed	Total Market Value	No. of Issues	Average Price	Total Shares Listed	Total Market Value	No. of Issues	Average Price
Automobile & Truck Mfg. Co.'s (and Holding Co.'s)	22	22	\$15.27	83,294,450	\$1,272,193,984	7	\$72.01	2,363,475	\$170,191,959	29	\$16.84
Automobile Access. Mfg. Co.'s (and Holding Co.'s)	35	35	8.04	22,260,561	178,984,477	5	25.43	297,409	7,562,353	40	8.27
AUTOMOBILE INDUSTRY.....TOTAL	57	57	13.75	105,555,011	1,451,178,461	12	66.80	2,660,884	177,754,312	69	15.05
RUBBER TIRE & GOODS INDUSTRY.....TOTAL	8	8	7.76	9,625,496	74,727,313	10	29.36	2,660,438	78,123,165	18	12.44
FARM MACHINERY INDUSTRY.....TOTAL	7	6	17.27	8,086,516	139,671,438	5	38.41	3,142,666	120,719,040	11	23.19
AIRPLANES-A'WAYS-A'PORTS.....TOTAL	9	9	5.68	16,477,486	93,598,876	2	8.87	1,380,433	12,230,866	11	5.93
Omnibus Operating Co.'s	3	3	5.20	1,085,277	5,644,138	1	55.25	88,823	4,907,471	4	8.99

Offers Vacuum Pump

EAST ORANGE, N. J., Jan. 21—Eclipse Aviation Corp., N. J., has placed on the market an engine-driven instrument vacuum pump designed to replace the venturi used to operate suction-driven aircraft instruments such as the bank and turn indicator, artificial horizon, and directional gyro. The pump is equipped with a flange to fit the standard four-bolt gun synchronizer drive pad on the engine and a socket in the pump rotor receives the drive from the nut on top of the synchronizer driveshaft.

This pump is said to have sufficient capacity to operate the three instruments mentioned at the normal throttled r.p.m. of the engine during a glide, and to operate all three instruments at an altitude of 10,000 ft. at normal cruising speed. During the warming-up period on the ground it provides sufficient suction to assure that the instruments operate correctly at the take-off.

The pump is of the rotary vane type and all wearing surfaces are on thin-wall nickel iron. Lubrication is effected through a pressure line from the engine, with a restriction in the pump limiting the amount of oil used to a few drops per minute. The weight is 3 3/4 lb.

Lincoln Sells 172 at Show

DETROIT, Jan. 19—Lincoln Motor Co. has reported that retail sales at the New York Automobile Show were greater in volume than at any other National Show in the company's history.

A total of 172 orders for new Lincoln 8 cyl. and 12 cyl. cars were closed in New York during show week. The volume was approximately 140 per cent greater than in 1931.

M.E.A. Protests Tax

NEW YORK, Jan. 20—The first official general bulletin of the Motor and Equipment Manufacturers Association is directed to the members, urging them to get into communication with the members of the Ways and Means Committee of Congress to protest additional taxation against the automobile industry.

The bulletin outlines the proposed excise taxes, points out the degree to

which the automobile is already taxed and urges the members of the Association to telegraph to the members of the Ways and Means Committee to protest against the additional tax.

Macauley Urges Cooperation

NEW YORK, Jan. 18—Alvan Macauley, president of the National Automobile Chamber of Commerce, in speaking before the Merchants' Association of New York last week, urged the cooperation of all business to bring about a return of public buying, erasing the fear and hysteria which now hold the consumer's dollar in check.

Mr. Macauley also discussed the proposals now being considered for Federal taxation of motor vehicles, pointing out that the motor vehicle is already one of the most heavily taxed of all assets.

Cite Show Interest

NEW YORK, Jan. 20—Exhibitors in the Accessory & Shop Equipment Sections of the recent National Automobile Show report that dealer interest in their products was greater than it had been for several years.

Prospects developed by exhibitors were, in most instances, not only greater in number but more definite than it has been for sometime past. Actual orders written at the show were larger and more numerous than it had been in years.

Rail Rate Cut Allowed To Meet Truck Push

WASHINGTON, Jan. 21—Railroads were authorized to reduce rates on cotton from the Southwest to New Orleans, La., in order to meet motor truck and barge competition by a modified order of the Interstate Commerce Commission, made public yesterday.

Triplex Sale Approved

NEW YORK, Jan. 20—Stockholders of Triplex Safety Glass Co. at a special meeting approved the sale of the entire flat glass and laminated glass business to the Libbey-Owens-Ford Glass Co.

Petroleum Imports Up

NEW YORK, Jan. 20—Imports of petroleum at the principal ports of the United States for the week ended Jan. 16 have been estimated by the American Petroleum Institute at 190,571 barrels daily. This compares with the daily average of 189,857 barrels for the week ended Jan. 9, and with 220,429 barrels daily for the four weeks ended Jan. 16.

Crude runs to stills during the week are placed at 2,124,900 barrels daily. Cracked gasoline produced during the week was placed at 3,034,000 barrels.

Stocks of gasoline at bulk terminals and in transit, east of California, for the week ended Jan. 16, totaled 13,273,000 gallons, as compared with 13,121,000 gallons, and with 12,096,000 gallons for the week ended Jan. 17, 1931.

Tax Opposition Grows

TOLEDO, Jan. 20—L. A. Miller, president of Willys-Overland, will go to Washington Saturday to appear before the House Ways and Means Committee in opposition to a Federal sales tax on automotive products. C. O. Miniger, R. A. Stranahan, and H. C. Tillotson, have joined in the attack on the tax plan as a blow at Toledo's automotive industry. Representative Wilbur M. White has pledged his support in the fight against this particular treasury proposal.

Michigan Employment Up

DETROIT, MICH., Jan. 18—Automobile employment in the state of Michigan during December totaled 128,832 against 110,457 for November and 163,882 for December, 1930. The aggregate weekly payroll was \$3,561,107 for December, \$3,270,231 for November and \$4,256,538 for December, 1930. Average weekly earnings per capita were \$27.64 for December, \$29.61 for November and \$25.97 for December last year.

Adds To Membership

NEW YORK, Jan. 18—Asbestos Brake Lining Association has admitted to associate membership those rivet manufacturers producing brake lining rivets.

Indiana Sells Marion Plant

Buying Group Headed by H. K. York, Who Has Been Manager

CORTLAND, N. Y., Jan. 19—R. F. Black, president of Indiana Truck Corp., wholly owned subsidiary of the Brockway Motor Truck Corp., announced today that the Indiana company has sold its plant and equipment at Marion, Ind., to a group of Marion capitalists which will continue the manufacture of Indiana trucks. The Marion group is headed by H. K. York, who has been the general manager of the Indiana Truck Corporation's business for the past 15 months. Mr. York will be president of the new company, which has been incorporated in Indiana, and will be known as Indiana Motors Corp.

Mr. Black announced that the Brockway company will confine their sales activity to the Eastern and Pacific Coast territory, where they have 15 branches and some 300 dealers. Brockway will also continue active in the export business, where they have always enjoyed a substantial business. It is understood that the Indiana company will confine their activity to the Middle West.

It was also announced that the Brockway company would maintain close working arrangements with the new Indiana Motors Corp., which will permit an exchange of engineering facilities, and by reason of similarity of design, would enable the two companies to continue to offer nation-wide service to the owners of Brockway and Indiana trucks.

Saskatchewan Farmers To Pay 2c Gas Tax

REGINA, SASK., Jan. 16—Following the decision of the government legislative caucus here, farmers of the province will now pay a 2-cent tax on gasoline. The government will levy a 5-cent tax on every gallon, and will then refund 3 cents to the farmer who uses gas for agricultural purposes. Last year he was refunded 5 cents per gallon.

New De Vaux Shown

THE new De Vaux model, known as the De Vaux 80, was exhibited in the lobby of the Hotel Commodore during New York Show Week. By a refinement in the porting, the engine horsepower has been increased to 75 at 3600 r.p.m. The wheelbase has been increased from 113 to 115 in. and the body has been increased in width 2 in. at both the front and rear, so the car is now larger all around. The radiator is now 1 in. higher. A Salisbury semi-floating rear axle is

used in the new models. All instruments are now of the dial type and the design of the instrument board has been changed. Free wheeling is standard equipment, the unit being located at the rear of the transmissions. Upholstery is now of the form-fitting type and body lines have been improved. A convertible coupe listing at \$945 has been added to the line.

Show Attendance Up, Sales Gain Five-Fold

NEW YORK, Jan. 20—Early compilations on the results of the National Automobile Show held in New York, Jan. 9 to 16, show paid attendance of between 25 and 26 per cent ahead of that of the show in 1931. While actual figures on sales consummated at the show have not yet been accurately compiled, it is roughly estimated that sales this year were approximately five times as great in volume as they were a year ago, according to the show management.

Rubber Imports Up

NEW YORK, Jan. 18—Imports of crude rubber for the month of December amounted to 51,931 long tons, the highest of any month since April, 1929, according to the Rubber Manufacturers' Association. Consumption during the month was 21,409 long tons, and total domestic stocks, as of Dec. 1, are estimated at 322,826 tons. Consumption for the year fell below 1930 by 26,994 tons, while inventories, as of Dec. 31, show an increase of 60.6 per cent over inventories of December, 1930.

Making New Starter Drive

TOLEDO, Jan. 19—The Safety Auto Starter Co. has been incorporated here and has engaged space for manufacturing operations in the Johnstone Machinery Exchange, Inc., plant, to build a new type of automobile starter invented by Arthur M. Peters, North Baltimore, Ohio. The new starter is said to eliminate starter pedal or button and operates when pressure is applied to the clutch pedal.

Export Managers Meet

NEW YORK, Jan. 18—Export managers of the National Automobile Chamber of Commerce at a meeting held here last week adopted a resolution pointing to the need of reciprocal tariff revisions between nations of the world in order to help restore employment and bring back prosperity. They made specific recommendations along these lines, which will be presented at the next meeting of the board of directors of the Chamber.

P. O. Buying Trucks

WASHINGTON, Jan. 20—The Post-office Department will open bids Jan. 29 for 2000 trucks.

Cycle Trades Seek Wider Field

Association Plans Expansion of Promotion Activities

NEW YORK, Jan. 18—The Motorcycle and Allied Trades Association meeting here last week voted for a nation-wide expansion of its activities to encourage a larger public participation in the sport of motorcycling, and to inaugurate a movement for a greater recognition of the motorcycle trade as a definite part of the automotive industry.

The association also decided upon a safety campaign for the coming year with two objectives. First, to inform the public of the safety of the motorcycle as a sport and utility vehicle, and, second, to urge drivers against riding practices which give the appearance of danger.

The motorcycle industry suffered less from the depression of 1931 than any other comparable group, and is in a stable condition for the coming year, it was pointed out.

The following officers were elected for the coming year: president, James A. Wright, sales manager of Indian Motorcycle Company, Springfield, Mass.; vice-president, Henry Mesinger, president of H. & F. Mesinger Mfg. Co., New York; secretary, Earl C. Smith; treasurer, Arthur Davidson, sales manager of Harley-Davidson Motor Co., Milwaukee. Directors: Walter Davidson, president of Harley-Davidson Motor Co.; E. Paul duPont, president of Indian Motorcycle Company; Arthur Davidson, James A. Wright, Henry Mesinger, Guy Wainwright, president of Diamond Chain & Mfg. Co., Indianapolis; F. J. Weschler, vice-president, of Duckworth Chain & Mfg. Co., Worcester, Mass.; Otto C. Ling, president of Otto C. Ling & Son, Inc., New York; Fred L. Morgan, automobile sales manager of Goodyear Tire & Rubber Co.; William T. Wilson, manufacturers' sales manager, Firestone Tire & Rubber Co.; E. L. Stoughton, vice-president of Wico Battery Co., Springfield, Mass.; E. C. Smith, Columbus, Ohio.

Moline Anticipates Loss

CHICAGO, Jan. 19—Estimated net loss of Minneapolis-Moline Power Implement Co. for the year ended December 31, 1931, as expressed by W. C. McFarlane, president, will approximate \$1,500,000 after charges, after charge-offs to inventory and receivables. This figure does not take into account any possible adjusting of foreign balances, particularly in Canada. In the previous year the company reported net income of \$1,043,940, equal after preferred dividends to 56 cents a share for the common stock.

Regulation Bill Read in Kentucky

Railroad Protection Seen In Act in Compliance With Governor's Stand

LOUISVILLE, KY., Jan. 18—Senate Bill No. 1 and House Bill No. 79, introduced in the Kentucky General Assembly Jan. 13 as the Young-Lebus Bill, would regulate trucks and buses, apply a license tax for use of the roads, and regulate them as common carriers, following out suggestion of the Governor that all competing transportation systems should be forced under state regulation, or on a competitive basis, giving railroads a measure of protection.

Under the terms of these bills the present commissioner of motor transportation, or bus commissioner, would probably be abandoned, as his work would be turned over to the Railroad Commission, leaving a vacant office. The bus commissioner has never had jurisdiction over trucks, the only license paid being to the State Tax Commission. The trucks would also go under the Railroad Commission. There are also measures proposed by the Governor for regulation of size of bodies, weights, rates, and whatnot.

Seek Car License Reduction

LOUISVILLE, KY., Jan. 19—Several bills have been introduced before the present week-old session of the Kentucky Legislature seeking to reduce cost of automobile licenses and operation. One bill would lower the registration fee to 25 cents per horsepower, with no regulation of weight involved. Another would continue the present plan of taxing horsepower and weight, but at a lower than the present basis.

Another bill would license cars and trucks from the time actually in use. Under the present state law a truck once licensed must pay license fee for the entire following year, even if it is not placed in service until the latter part of the year.

Among other bills are bills to place production tax on all crude oil produced in the state to go to the state, others for counties to secure a production tax on crude. Then there are several bills to split the gasoline or highway tax as between state and counties, so that counties could build roads of their own. Such measures are legion. Some would divide one-fifth of the 5-cent tax equally as among all counties.

Giddings Gets Ford Order

FOND DU LAC, WIS., Jan. 18—Orders from Ford and other automotive plants have enabled the Giddings & Lewis Machine Tool Co. here to speed up output to a near capacity basis.

Chicago Show Week Events

Packard Luncheon Meeting, Edgewater Beach Hotel, 10:15 a.m.	Jan. 30
Graham-Paige Luncheon, Palmer House Feb. 1	
NADA Meeting, Palmer House Feb. 1 and 2	
Oakland Motor Luncheon, Palmer House Feb. 1	
Auburn Luncheon, Stevens Ho- tel, 12 o'clock Feb. 2	
Chevrolet Banquet, Palmer House, 6:30 p.m. Feb. 2	
Automotive Electric Asso. Lunch- eon meeting, Stevens Hotel, 1 o'clock Feb. 2	
Int. Asso. of Shows and Asso. Managers Luncheon, Palmer House Feb. 2	
Willys-Overland Banquet, Pal- mer House, 6:30 p.m. Feb. 3	
Chrysler Sales Luncheon, Con- gress Hotel Feb. 3	
Oldsmobile Dinner, Congress Ho- tel, 6:30 p.m. Feb. 3	
Dodge Bros. Luncheon, Congress Hotel, 12:30 Noon Feb. 4	

Aero Show Expects To Surprise Fans

1932 Event in Detroit Includes New Autogiro

DETROIT, Jan. 16—A two-place, side-by-side, cabin-type autogiro, a newly developed 10-place, single-engined transport plane, and many other surprising samples of what American airplane manufacturers have to offer the 1932 sky traveler will be among the exhibits at the National Aircraft Show of 1932. The show will take place here April 2 to 10 under the sponsorship of the Aeronautical Chamber of Commerce of America, Inc., with Ray Cooper as manager.

The cabin-type autogiro is the first of its kind built in the United States and the first autogiro to provide side-by-side seating accommodations. It will be exhibited by Kellett Aircraft Corp., Philadelphia, and is powered by a 165-hp. Continental engine.

An example of the efficiency present-day aircraft makers built into airplanes will be seen by such craft as the 10-place, single-engined "Pilgrim" transport and the 15-place, single-motored Bellanca "Air Bus."

Waco Aircraft Co. will display a three-place open Waco biplane and a four-place Waco cabin biplane. Nicholas-Beazley Airplane Mfg. Co. plans to exhibit a "special development."

Another concern, with a secret model to be revealed later, is the Aeronautical Corp. of America, Cincinnati, builders of midget Aeronca monoplanes. One of the company's show ships, however, will be a two-place Aeronca Collegian, which is powered by a 36-hp. engine of their own make.

Practically the entire aeronautical industry will participate in the exposition, which is the second consecutive annual show to be held here by the Aeronautical Chamber of Commerce of America.

Tennessee Tax Fifth of Revenue

20c on \$1 Income Now Paid to State, Operators are Told

MEMPHIS, TENN., Jan. 18—Commercial motor truck operators in Tennessee must now pay approximately 20 cents out of each dollar of revenue to the state in taxes, Richard A. Gleaves, counsel for the Tennessee Motor Truck Association, told local truck operators yesterday in a meeting at Hotel DeVoy.

The tax is graduated from half a cent to 5 cents a mile, depending on the size of the truck, and is levied on both intrastate and interstate transportation wherever the truck crosses a county line. Truck operators must report their intercounty mileage to the State Department of Revenue at Nashville monthly and make payment.

The new load limit of 20,000 lb. gross on single unit trucks holds the pay load to a maximum of about 2½ tons, commercially unprofitable. However the semi-trailer truck is rated as two units, allowing a gross weight of 40,000 lb.

"We can operate under this ruling," Mr. Gill said, "as a pay load up to 10 tons is possible if the equipment is not too heavy."

Charles N. Candee

TORONTO, ONT., Jan. 16—Charles N. Candee, 75, president of Gutta Percha & Rubber, Ltd., died here on Jan. 13. He was born in Rochester, N. Y., but lived here since 1886, where he devoted his business career to the rubber industry. He began as a clerk at Syracuse, N. Y., and came to Toronto as assistant manager of Gutta Percha & Rubber Mfg. Co. He became vice-president of the reorganized company in 1913 and three years later became president and managing director. In 1928 Mr. Candee surrendered his managerial duties, but retained the presidency.

Borg & Beck Shows Gain

CHICAGO, Jan. 18—Borg & Beck Co., subsidiary of Borg-Warner Corp., reports 1931 business showed an increase of 15 per cent over 1930, C. S. Davis, president of the corporation, announces. Business in December was equal to the corresponding month of 1930.

McCord Exchange Approved

CHICAGO, Jan. 16—Holders of 80 per cent of the stock of McCord Mfg. Co., representing a preponderance of each of the company's three classes of stock, have accepted the exchange offer made by McCord Radiator Mfg. Co., a letter to stockholders of the former company reveals.

Airport Census Shows Increase of 311 During 1931, Government Report Indicates

WASHINGTON, Jan. 18—There were 311 more airports and landing fields in the United States on Jan. 1, 1932, than there were on the corresponding date in 1931, according to a report prepared by the Aeronautics Branch of the Department of Commerce and made public today.

On Jan. 1, 1931, there were 1782 municipal, commercial, intermediate, auxiliary, Army, Navy and miscellaneous government private and state airports and landing fields, while on Jan. 1, 1932, there were 2093 such landing facilities.

California led all other states in the number of airports and landing fields, having a total of 175, while Texas was second with 141. Pennsylvania, with 103, occupied third place. California, aside from having the largest total, also had the largest number of municipal airports, 59. Pennsylvania led in number of commercial airports with 67. Alaska had the largest number of auxiliary fields, 62.

The list compiled by the Aeronautics Branch shows that on Jan. 1, 1932, there were 636 municipal, 673 commercial, 404 intermediate, 300 auxiliary, 54 Army, 13 Navy, and 13 miscellaneous airports and landing fields. On Jan. 1, 1931, there were 550 municipal, 564 commercial, 354 intermediate, 240 auxiliary, 53 Army, 14 Navy, and 7 miscellaneous airports and landing fields. Of the total number of airports and landing fields the largest increase has occurred in the number of commercial airports. There were 673 of these on Jan. 1, 1932, while on that date a year before there were 564.

Those fields established by cities and towns are classified as municipal, and those established by private commercial interests are classed as commercial airports. Intermediate landing fields are established and maintained by the Department of Commerce on the Federal airways, and are marked for both day and night identification from the air.

Outboard Patents Pooled

MILWAUKEE, Jan. 18—Outboard Motors Corp., Milwaukee, and the Johnson Motor Co., Waukegan, Ill., the two principal manufacturers of outboard engines in this country, have reached an agreement which terminates long standing litigation that has had a disturbing effect upon the growth of the industry, according to an announcement by Ole Evinrude, president of Outboard Motors. The agreement brings about a situation paralleling that in the automotive industries. The two companies will continue to maintain individual designs and sales features in their products, but features developed and controlled by one company are made available to the other. The terms of

Status of Airports and Landing Fields by States, Jan. 1, 1932

	Municipal	Commercial	Intermediate	Auxiliary	Army	Navy	Miscellaneous, Government, Private & State	Totals
Alabama	6	4	9	7	3	..	..	29
Alaska	5	2	..	62	..	..	..	69
Arizona	23	7	13	7	1	..	..	51
Arkansas	13	5	4	6	..	..	..	28
California	59	62	27	23	3	1	..	175
Colorado	17	8	5	7	1	..	..	38
Connecticut	6	10	1	2	..	..	..	19
Delaware	..	2	..	..	1	..	1	4
Dist. of Columbia	..	1	..	..	1	1	..	3
Florida	28	15	4	11	..	2	..	60
Georgia	17	2	19	1	1	..	..	40
Idaho	21	1	10	12	..	..	2	46
Illinois	14	47	12	5	2	1	..	81
Indiana	8	19	14	1	1	..	..	43
Iowa	10	16	11	3	..	..	..	40
Kansas	23	20	6	5	2	..	..	56
Kentucky	5	8	7	..	..	..	..	20
Louisiana	10	6	2	4	..	..	..	22
Maine	2	9	..	5	..	..	1	17
Maryland	2	11	3	3	3	..	1	23
Massachusetts	4	27	2	6	..	1	1	41
Michigan	35	29	2	7	2	..	1	76
Minnesota	14	8	2	1	1	..	..	26
Mississippi	10	1	4	3	..	..	..	18
Missouri	6	10	11	3	..	..	..	30
Montana	15	4	9	6	..	..	..	34
Nebraska	11	5	13	..	1	..	..	30
Nevada	7	2	13	2	..	1	..	25
New Hampshire	7	4	..	6	..	..	..	17
New Jersey	5	18	1	2	1	1	..	28
New Mexico	9	5	10	8	1	..	..	33
New York	16	54	9	7	3	..	1	90
North Carolina	12	10	9	5	1	..	..	37
North Dakota	12	4	..	..	..	..	..	16
Ohio	13	40	18	8	4	..	1	84
Oklahoma	24	15	9	10	1	..	..	59
Oregon	17	6	19	5	..	..	..	47
Pennsylvania	6	67	18	7	3	1	1	103
Rhode Island	8	..	..	1	..	..	2	11
South Carolina	8	4	3	..	..	1	..	16
South Dakota	7	13	..	2	..	..	..	22
Tennessee	9	5	8	5	..	..	..	27
Texas	52	13	43	21	12	..	..	141
Utah	3	..	19	..	..	..	..	22
Vermont	3	7	..	1	1	..	1	13
Virginia	10	8	10	4	1	2	..	35
Washington	17	13	6	2	3	1	..	42
West Virginia	2	7	..	3	..	..	..	12
Wisconsin	22	29	7	8	..	..	..	66
Wyoming	11	2	12	3	..	..	..	28
Totals	636	673	404	300	54	13	13	2,093

the agreement offer even greater inducement to both engineering departments to further refine the design and increase the efficiency of outboard engines than has been possible heretofore without a cross-license patent agreement.

Wilson With Santa Monica

Fred S. Wilson, former vice-president and Pacific Coast manager of the Thermoid Rubber Co., Trenton, is now industrial adviser of Santa Monica, Calif. He was connected with Thermoid for 30 years.

Auburn Profits Triple in 1931

Company Earnings
\$17.64 Per Share
In Record Year

AUBURN, IND., Jan. 18—Auburn Automobile Co. and its subsidiaries for the 12 months ended Nov. 30, 1931, earned consolidated net profits amounting to \$3,579,849, equal to \$17.64 per share on 202,909 shares outstanding at that date. In the corresponding 12 months' period of 1930, consolidated net profits were \$1,018,331, or \$5.02 per share on the basis of an equal number of shares outstanding.

The consolidated balance sheet of the company and its subsidiaries as of Nov. 30, 1931, reflects current assets amounting to \$14,401,084 (of which \$8,409,716 was cash and government securities), and current liabilities of \$1,923,840, or a current ratio of better than seven to one.

In a letter to the stockholders of the company, E. L. Cord, president, said:

"Extraordinary acceptance of Auburn's products in the last fiscal year resulted in the sale of two and one-half times as many units as were sold in the preceding year. This is of marked and favorable contrast with a 30 per cent decline in the industry as a whole during this period. While the dollar sales volume only increased about one-half, net profits were more than three and one-half times earnings for the preceding year.

"Undistributed earnings during the past year account for the companies' strong balance sheet working capital position, notwithstanding substantial plant extensions and continued expenditures for the development of new and improved products, which the management believes will merit increased public acceptance. Confirmation of this opinion has been obtained at the three principal shows held to date in 1932 where latest figures show approximately 50 per cent more retail orders have been received than were secured at corresponding 1931 shows."

Packard Show Sales Jump

DETROIT, Jan. 20—During the week of the New York Show actual Packard retail sales made at the show display and at a Packard Salon in Roosevelt Hotel totaled 127, exceeding any previous show sales total by almost 100 per cent.

Graham Shipments Up

DETROIT, Jan. 20—Graham-Paige has announced that shipments last week were the largest of any week since May last year. At the close of the show, according to the announcement, there were 342 unfilled retail orders on hand in the New York area.

++ CALENDAR ++ OF COMING EVENTS

SHOWS

Newark, N. J., Automobile.....	Jan. 16-23
Omaha, Neb., Automobile.....	Jan. 16-23
Toledo, Ohio, Automobile.....	Jan. 16-22
Cincinnati, Automobile	Jan. 17-23
Milwaukee, Wis., Automobile.....	Jan. 17-23
Philadelphia, Automobile	Jan. 18-23
Louisville, Ky., Automobile.....	Jan. 18-23
Columbus, Ohio, Automobile.....	Jan. 23-28
Boston, Mass., Automobile.....	Jan. 23-30
Minneapolis, Minn., Automobile.....	Jan. 23-30
Hartford, Conn., Automobile.....	Jan. 23-30
Detroit, Automobile	Jan. 23-30
Montreal, Automobile	Jan. 23-30
Baltimore, Automobile	Jan. 23-30
Pittsburgh, Pa., Automobile.....	Jan. 23-30
Portland, Ore., Automobile.....	Jan. 23-30
Springfield, Mass., Automobile.....	Jan. 25-30
Harrisburg, Pa., Automobile.....	Jan. 25-30
Seattle, Wash., Automobile.....	Jan. 25-30
St. Petersburg, Fla., Automobile.....	Jan. 27-29
National Automobile, Chicago,	
	Jan. 30-Feb. 6
Salon, Chicago	Jan. 30-Feb. 6
Washington, D. C., Automobile	Jan. 30-Feb. 6
Cleveland, Automobile	Jan. 30-Feb. 6
Grand Rapids, Mich., Automobile,	
Springfield, Ill., Automobile.....	Feb. 1-6
Plainfield, N. J., Automobile.....	Feb. 6-13
St. Paul, Minn., Automobile	Feb. 6-13
St. Louis, Automobile.....	Feb. 7-13
Denver, Colo., Automobile.....	Feb. 8-13
Indianapolis, Ind., Automobile.....	Feb. 13-19
Salon, Los Angeles, Calif.....	Feb. 13-20
Kansas City, Automobile.....	Feb. 13-20
Mankato, Minn., Automobile.....	Feb. 17-20
Peoria, Ill., Automobile.....	Feb. 17-21
Holyoke, Mass., Automobile.....	Feb. 18-22
Des Moines, Iowa, Automobile.....	Feb. 21-26
Wichita, Kan., Tractor and Power Equipment	Feb. 23-26
Salon, San Francisco, Calif.....	Feb. 27-Mar. 5
Albany, N. Y., Automobile.....	Feb. 27-Mar. 5
Berne, Switzerland, Automobile.....	Mar. 11-20
National Aircraft, Detroit, Mich.....	Apr. 2-10

FOREIGN SHOWS

Copenhagen, Automobile	Feb. 26-Mar. 6
Lyons, France, Passenger and Commercial	Mar. 7-20
Geneva, Switzerland, Passenger and Commercial	Mar. 11-20
Vienna, Passenger and Commercial	Mar. 13-20
Tel Aviv, Palestine (Levant Fair)	April 7-30
Milan, International Automobile Salon	April 12-27
Zagreb, Yugoslavia, Automobile Salon	April 23-May 2
Pezan, Poland, International Fair	May 1-8
Dublin, Commercial	May 4-7
Budapest, International Fair.....	May 7-16
Belfast, Commercial	May 25-28
Bordeaux, Fair	June
Cork, Commercial	June
Inverness, Commercial	June 21-24
Southampton, Commercial	July 5-9
Llandrindod, Wales, Commercial	July 20-22
London, Olympia Show	Oct. 13-22
Glasgow, Scottish Motor Show.....	Nov. 11-19

CONVENTIONS

S.A.E. Annual Meeting, Detroit, Mich.,	Jan. 25-29
Nat. Assoc. of Engine and Boat Mfrs., New York City.	Jan. 29
American Institute Mining & Met. Engrs., Meeting, New York City,	Feb. 15-19
American Welding Society, Annual Meet- ing, New York City.....	Apr. 27-29

Goodyear - Canada On 24-hr. Schedule

Outlook for 1932 Bright,
Head of Company Says
as Production is Boosted

NEW TORONTO, ONT., Jan. 16—The Goodyear Tire & Rubber Co. of Canada, Ltd., has inaugurated 1932 by returning to a full plant schedule of 24 hours a day, five days a week, effecting a 25 per cent increase in production for the company. D. J. McCarthy, general sales manager, announced that the business of the company for the final quarter of 1931 equaled the previous 1929 all-time record for a like period.

Mr. McCarthy predicted that 1932 will be an active year in the production of motor cars and accessories. The decision to operate on a schedule of four six-hour shifts is intended to aid in alleviating distress by providing at least part-time employment for a larger number of men and women.

It is said here that Goodyear was the first Canadian company to adopt this plan of more daily shifts of shorter duration, and that relief workers and town officials claim that New Toronto and neighboring municipalities have less actual distress than is to be found in any similar industrial communities elsewhere in Canada. This is due to a higher percentage of the population having a part income for the greater portion of the period of low production.

Franklin Plans Body Output

SYRACUSE, N. Y., Jan. 20—A plant for the manufacture of Franklin automobile bodies, which will employ 150 men, is a project announced yesterday by the H. H. Franklin Mfg. Co. in a statement saying that full operations will be got under way as quickly as possible in order to insure first production in March.

Top floor of the main Franklin building comprising 52,000 sq. ft. of floor space will be utilized for body building. Placement of machinery begins at once, to be followed immediately by construction of jigs and fixtures necessary for quantity production.

Cincinnati Attendance Reported Good

CINCINNATI, Jan. 18—The 1932 Automobile Show staged by the Cincinnati Auto Dealers' Association opened yesterday with a crowd that equaled the opening day's attendance in 1931 in spite of rain that continued throughout the afternoon and evening. President J. W. Tarbill announced that actual receipts were but \$155 under the total last year.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Oilgear Sideplate Vertical Presses

Featuring the use of one piece welded steel construction, The Oilgear Co., Milwaukee, Wis., offers a line of All-steel vertical, sideplate type presses. Three sizes are available, 8, 10 and 12 ton capacity. Recommended motor size is $7\frac{1}{2}$ hp., 1200 r.p.m. constant speed. Net weight, 2800, 3000 and 3200 lb. respectively.



enclosed in the frame structure with convenient space for making adjustments.

The pump, with integral four-way plunger type by-pass control valve, uses the same running parts included in Oilgear type "WES."

Press cylinder construction includes bored and honed cylinder tube; piston ring type piston; large ram; bronze ram guide, and molded ram packing.

Hand and foot pedal control with adjustable stroke limit stops are standard equipment. Single speed semi-automatic control is extra.

These presses are arranged for either Texrope or Dayton Cogbelt motor drive. Copper tubing and extruded brass fittings are used for connecting the pump to the press cylinder.

Cooper Gasket Material and Cut Gaskets

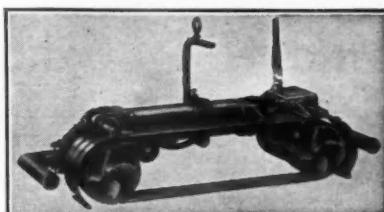
The Cooper Mfg. Co., Marshalltown, Iowa, announces the addition to its line of automotive products of a sheet packing made from hemp and jute paper, known as Gaskoid. The material is impregnated to make it impervious to oil, gasoline, paint, water,

etc. Gaskoid is supplied to the automotive trade in rolls of 25 or 50 yards length or in 18 by 36 in. sheets. The company's plant is said to be equipped with modern gasket-producing machinery, and in addition to the sheets and rolls it offers Gaskoid fabricated gaskets of all types.

Hicycle Continuous Belt Sander

The Chicago Pneumatic Tool Co., New York, N. Y., enters the field with a

portable continuous belt sander, electrically operated by two motors each developing in excess of 2 b.h.p. Belt tension is maintained by a compressed



air mechanism while the load is equally divided by synchronizing the motors. For automotive work, the most important applications are in body plants for smoothing welds on cowls, body panels, and the like. One switch controls both motors.

Net weight, 62 lb. Loaded belt speed, 6700 ft. per minute.

The New Warner & Swasey No. 3 Universal Turret Lathe

The No. 3 Universal Turret Lathe with a $1\frac{1}{2}$ in. bar capacity and a maximum swing of 15% in. has been added by the Warner & Swasey Co., Cleveland, Ohio. It incorporates many features which are said to add substantially to the productivity of the machine.

Six spindle speeds, from 67 to 740 r.p.m., are quickly obtained by conveniently located levers with forward and reverse provided for all speeds. Head clutches are designed for high torque at low speed and are easily adjusted. The spindle is mounted in double Timken roller bearings, front and rear.

The hexagon turret is mounted on a Timken roller bearing. An adjusting nut is provided for proper freedom of movement, but does not interfere with the permanent, accurate alignment of the turret. Automatic indexing, with an automatic turret

binding mechanism, greatly increases the convenience of operating the turret. Six power feeds are provided for the hexagon turret.

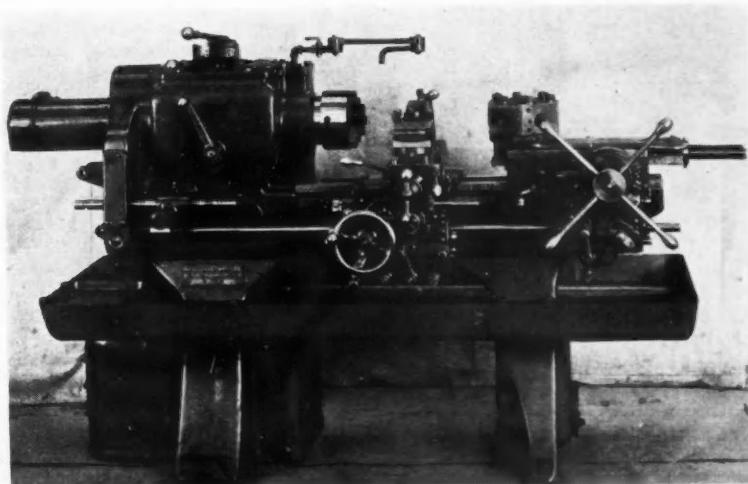
The Universal Carriage is equipped with a quick indexing square turret and is provided with six power cross longitudinal feeds, both forward and reverse.

Levers on both aprons are conveniently located and the power feed is easily engaged and disengaged by a very slight pressure. An automatic feed throwout disengages the longitudinal power feed at the end of cuts.

The cross slide carriage stop roll has six stop screws which make possible the cutting of more than one diameter with one tool in the square turret.

A self contained cabinet leg motor drive is standard for the machine. A 3 hp. motor is recommended for light duty; 5 hp. for heavy duty.

(Turn to page 140, please)



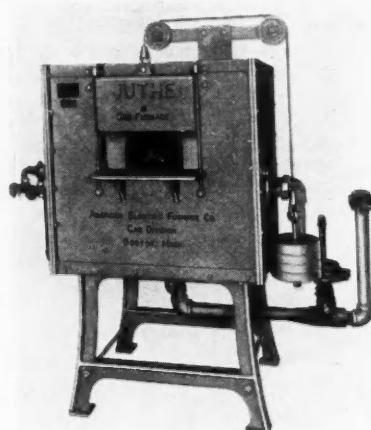
NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

New Line of American Furnaces

The American Electric Furnace Co., Boston, Mass., presents a new line of gas and electric heat-treating furnaces. Five new models are described here.

The first of these is the Juthe high-speed gas furnace, shown in the accompanying illustration, of the HG-1 size, which has an effective hearth area 8 in. wide 14 in. deep and 6 in. high. It has a complete muffle of silicon carbide, is fitted with patented atmospheric control which is said to prevent oxidation of the work, and is designed for temperatures up to 2500 deg. Fahr. The burners are of the tunnel type, staggered in position, and so designed that they are cool at this temperature. The furnace is usually fitted with a proportional mixer which automatically maintains the correct air-gas ratio, and an automatic control valve which in conjunction with a control pyrometer is said to accurately maintain any desired temperature in the furnace within the ranges for which the furnace is designed.



Juthe preheating gas furnace of the G-2 size has an effective working area of 12 in. wide, 18 in. deep, and 8 in. high and in construction is very similar to the HG series with the exception of burners and muffles. In this case the burners are fed from one manifold on each side of the furnace, and the muffle is of heat resisting alloy instead of silicon carbide. Both furnaces are of standardized unit construction.

Model P-31 Furnace is made in

several sizes ranging from 6 in. in diameter and 10 in. deep to 16 in. in diameter and 40 in. deep. It differs from other cylindrical pot furnaces in that the heating elements are formed in one continuous helical coil. This coil is retained in place in spiral grooves in the heating element tile, and requires no other frame work, hooks, retaining bars, or other mechanism to hold it in position. These furnaces are used for lead, cyanide, and salt hardening.

Another in the series is the HB-10 "American" electric high-speed furnace which is the smallest size of this type made by the company. It is equipped with four horizontal Globar heating elements, two above and two below the heating chamber. It is also fitted with patented atmospheric control. Two manometers on this control permit the operator of the furnace to duplicate any previous condition of atmosphere without loss of time and with assurance that the work will be produced in the condition desired. The operating range extends to 2500 deg. Fahr. The effective working area of the chamber is 8 in. wide x 12 in. deep x 5 in. high.

This company recently shipped a special high-speed electric furnace to the Soviet for use at the Autostroy plant. The electrical capacity, as shipped, was 100 kw. on 380 volts, 3 phase, 50 cycle current. It can also be built for 100 kw. on 230 volts, 3 phase, 60 cycle current. 24 Globar brand elements are connected in two groups, each on 3 phase, and overlapping in such a way that uniformity of temperature is obtained in the heating chamber at all times. In addition there are two sets of double throw switches mounted on one side of the furnace which, when thrown into the opposite position, change the grouping of the heating elements so that an increased voltage is impressed on each element.

Oilgear Cyclematic Vertical Broaching Machine

After a long period of research, The Oilgear Co., Milwaukee, Wis., has placed on the market a line of "Cyclematic" vertical broaching machines in a wide range of sizes. The type "XM-12," has a normal capacity of 12,000 lb., a peak capacity of 15,000 lb., a maximum stroke of 42 in. and a cutting speed of 34 ft. per min. The type "XM-26" has a normal capacity of 26,000 lb., a peak capacity of 33,000

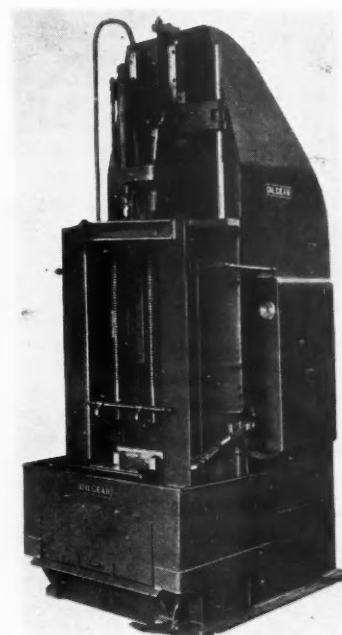
lb., maximum stroke of 48 in., and a cutting speed of 18 to 32 in. per min. The type "XM-44," has a normal capacity of 44,000 lb., a peak capacity of 55,000 lb., a maximum stroke of 54 in. and a cutting speed of 29 ft. per min.

Some salient features characterizing this line are given below:

Convenient loading height, 30 in. from floor, for all lengths of broaching tools.

Work is placed on table . . . only fixtures to roughly centralize work under broaching tools are required.

Single lever control with automatic broach handling.



Broach handling is positive. Tools are lowered accurately, automatically centralizing the work.

Broaching tools rigidly secured at both ends during major portion of broaching stroke.

Positive broach lubrication.

All steps of the machine cycle are positively interlocked so that each must be completed or the machine stops automatically.

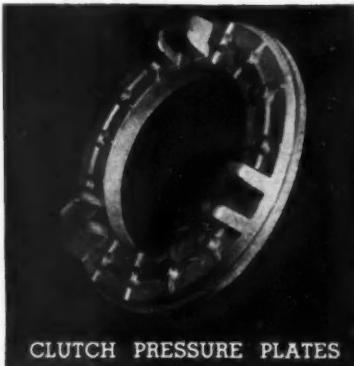
Machine will operate continuously at full load and maintain full rated broaching speed.

Paasche Type U B U Multiplehead Air Brush

An air brush which can be provided with any one of a number of different heads to produce either a narrow line or a wide, smooth fan spray, has been placed on the market by the Paasche Airbrush Co., Chicago, Ill. It eliminates the need for a number of air brushes for work of different size. It will handle all kinds of material from the lightest to those of plastic character and is designed for use in auto-body shops, garages, studios.

(Turn to page 142, please)

• Cast FROM GUNITE
FOR GREAT STRENGTH,
LONG WEAR, LOW COST



CLUTCH PRESSURE PLATES



ROCKER ARMS



BRAKE DRUMS

Brake drums, rocker arms, clutch pressure plates -- here is a wide range of material engineering problems. But Gunite has solved them all -- and many more. Because Gunite is STRONG -- 50,000 pounds tensile strength per square inch. Gunite is RIGID -- a rigidity that resists deformation under heat and pressure. Gunite is LONG WEARING -- a quality due to its dense structure and graphitic content. Gunite is CAST -- and that means economy over forged parts. It means design flexibility, speedy production. And because Gunite MACHINES EASILY, finishing costs are reduced to a minimum. If you have a metal part which is costing too much, which is failing in service, which you think might be improved -- give us the facts and get the Gunite story. Let Gunite repeat for you what it has done for others. The handy coupon below is for your convenience.

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ADDS STRENGTH...ADDS WEAR...CUTS COST

GUNITE THE PEARLITIC

SEND
US THE
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ROCKFORD, ILLINOIS, U.S.A.

IRON

Send the Gunite story. () Description and () blueprint of part about which we are inquiring is attached. We understand that this places us under no obligation.

Name..... Company.....

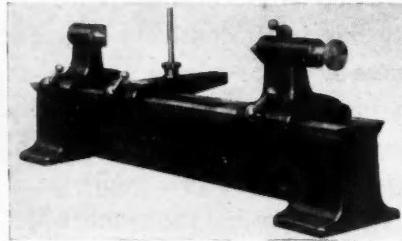
Title..... Address.....

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Barber-Colman Bench Center

A new bench center has recently been announced by the Barber-Colman Co., Rockford, Ill. This inspecting tool can be used for gage-testing, circular, cylindrical, and such other work as may be held on arbors, and such pieces as shafts, pinion shafts, plugs, and others that may be held between centers. The bench center may also be used for determining the parallelism of keyways with regard to the axis of the shaft, or eccentricity.



The bed is of ribbed box construction, with scraped dovetail ways. The head and tailstocks are independently adjustable, and each is fitted with a hardened and ground steel center. The tailstock has a spring-loaded center which may be clamped while a piece is held between centers. The slide or indicator base is provided with a vertical post which may be moved to any position in or out between centers, and is intended for use in holding a dial indicator.

Owens-Illinois "Dustop" Air Filter

An air filter unit of glass wool called "Dustop" has been placed on the market by the Owens-Illinois Glass Co., Toledo, Ohio. It has several features of special interest. The container is of paper, which adds to its lightness and renders it readily disposable. Although it weighs only two pounds, it is said to absorb dust in excess of its own weight. The "flexibility" of the paper container establishes a tight seal between the filter and the metal frame into which it fits, thus preventing the passage of any unfiltered air around the unit.

It has been designed 2 in. in thick-

ness, so that when a standard 4 in. pack is established by using two units in tandem, or two units placed face to face, it is only necessary to change one-half the thickness of the total pack at one time. Two units in tandem are said to remove 99 per cent of the dust from the air.

Doehler Brass Die Castings

Die castings made from a special brass alloy known as Brastil are now being offered the industry by Doehler Die Castings Co. of New York. The

new alloy appears to have remarkable properties, to judge by the following figures given out by the Doehler company:

Tensile strength, 90,000-95,000 lb. p. sq. in.

Elongation, 10-17 per cent in 2 in. Brinell hardness, 160-180 (3000 kg. load)

Weight per cu. in., 0.29 lb.

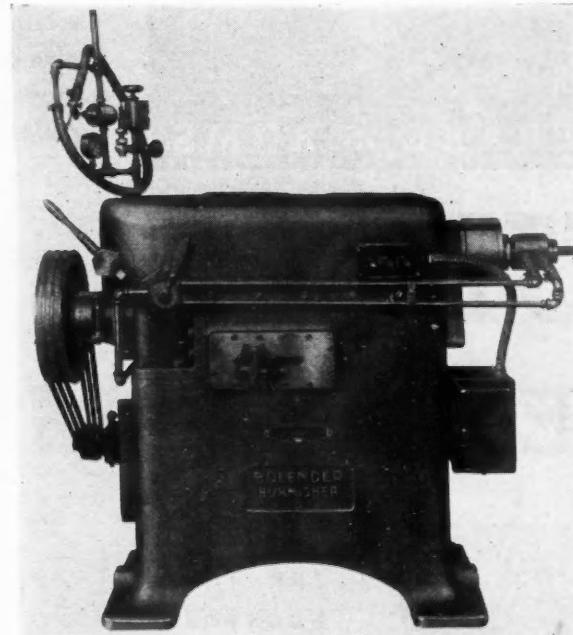
Brastil can be turned, tapped, reamed and drilled without difficulty, and it also can be soldered and welded. It has a high resistance to corrosion, and it is as resistant to acids and alkalies as any other known copper alloy, according to the manufacturers.

The alloy is said to have valuable bearing properties. It is believed that since the new alloy has strength equal to that of steel, many parts which have been made of steel in the past will be made of it, one advantage being that the die castings come accurate to size and with a smooth finish. The metal has the same general appearance as white gold and therefore has decorative value. It can also be given an oxidized finish.

Semi-Automatic Bolender Burnisher

The model No. 1 Bolender semi-automatic burnisher with a capacity of 8½ in. O.D. for spur and helical gears has been added by the City Machine

the cycle is controlled by a three-button switch which permits the operator to burnish the work in one direction, reverse and stop. Although this particular model is shown air-equipped, the machine may also be furnished with the hydraulic unit. Built-in cool-



Works, Dayton, Ohio. This model has practically all the features of the larger Bolenders, such as burnishing pressure exerted horizontally to the center of the master burnishers; flat gear mounting, and variable burnishing pressure. However, it is smaller and does not have a fully automatic burnishing cycle. Instead,

ant system and Timken bearings are standard.

Due to its smaller size and absence of fully automatic control this machine can be furnished at a very attractive price for those users whose production does not justify one of the larger fully automatic models.

(Turn to page 144, please)

FELLOWS ANNOUNCEMENTS

A PRODUCTION MACHINE For Cutting HOURGLASS WORMS

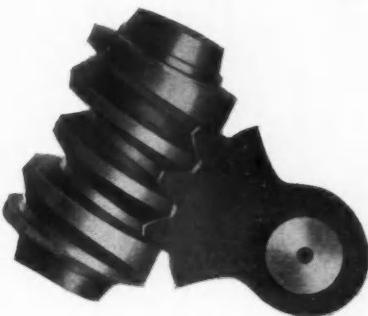
Here is a new machine which will both improve the quality of your Hourglass Steering Worms and CUT THE COST OF PRODUCTION.

Cutting is continuous, achieving extraordinarily high production. Owing to the ideal application of the Gear Shaper Cutter — the machining action is highly efficient and enables the attainment of a smooth finish AT A HIGH RATE OF SPEED.

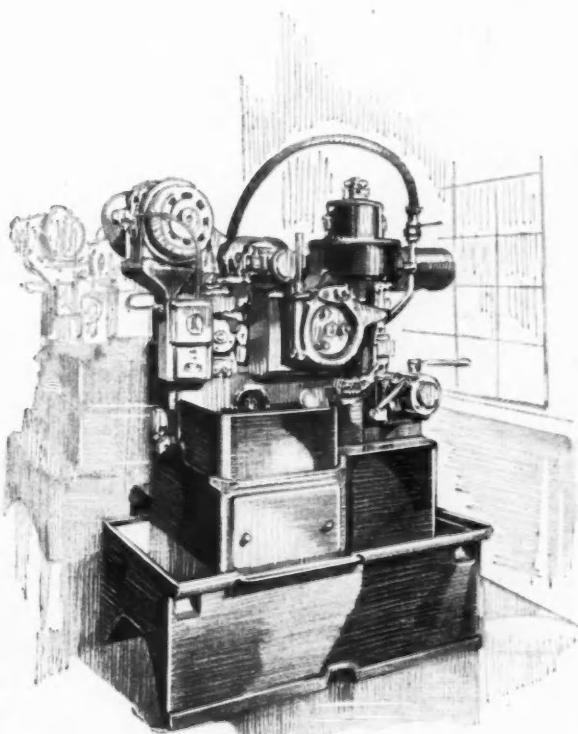
Accuracy is unimpaired by resharpening the cutter. A side-trimming mechanism holds the thread proportions under constant control. The required profile is maintained throughout the entire life of the cutter.

Simplicity of loading and ease of control contribute to the overall economy of the FELLOWS production unit.

For complete description and specifications, write: THE FELLOWS GEAR SHAPER COMPANY, 78 River Street, Springfield, Vermont, U.S.A. (616 Fisher Building, Detroit, Michigan).



*Hourglass type steering worm
and helical tooth sector*



Front view of Fellows Hourglass Thread Generator for cutting Hourglass Worms at a high rate of production

FELLOWS
~ GEAR SHAPERS ~

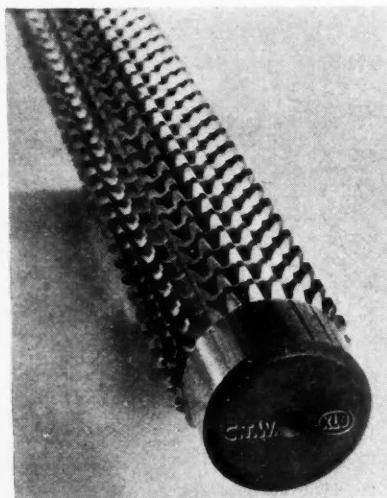
NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Broaches for Finishing Internal Gears

One of the requirements of the automotive industry has been to increase the production on internal gears. They have been able to do this by the use of internal gear tooth form broaches which have a true involute tooth form. The development of this type of broach opens many new fields at a saving of cost over the previous methods used.

The illustration shows the finishing end of the type of broach made by the Ex-Cell-O Aircraft & Tool Corp., Detroit, Mich. No additional operations are necessary, such as grinding or boring, as the gear is finished in one pass of the broach. Operations start from a drilled hole. The teeth in each row must be absolutely straight to insure high accuracy and finish. The section at the pull end of the broach is designed for sizing the hole



and the remainder of the broach for broaching the form on each tooth. Special equipment has been installed for developing a true tooth form covering general requirements. A range of diameters with a corresponding range in number of teeth can be furnished.

The limits on these broaches were held to 0.0003 in. on the splines, outside diameter to 0.0001 in. and the accumulated error in the spacing of the teeth not to exceed 0.0002 in. The first section removes approximately 0.045 in. stock. The pull end is designed for an automatic coupling which simplifies and speeds up the

handling of the broach during the broaching operation.

No broaching fixtures were required for this job as a soft steel reducing bushing supports the part during the operation, which is performed on a horizontal type of machine.

Molybdenum Hacksaw

Clemson Bros., Inc., Middletown, N. Y., pioneers in the hacksaw industry, announce the introduction of the Star Molybdenum Heavy Duty Hacksaw.

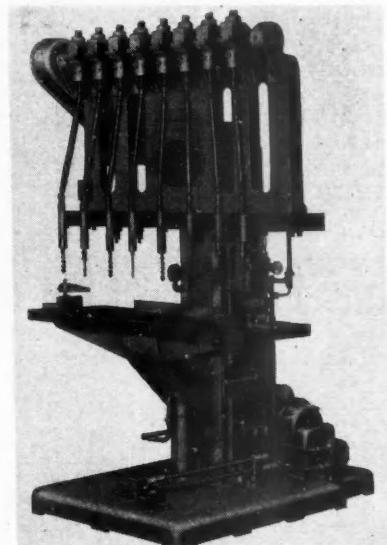
Using molybdenum as the vital element of the new blade, processes have been developed to produce a blade of the toughness, sharpness and other qualities necessary in a heavy duty blade. Molybdenum, being somewhat cheaper than other alloys used in hacksaw blades, Clemson Bros. is able to offer this heavy duty blade to the trade at a considerable saving in cost.

Root Vertical Hydraulic Multiple Drill

The B. M. Root Co., York, Pa., manufacturers of woodworking machinery, is now offering the style CH hydraulic feed borer to the metal cutting industry for drilling metals, com-

position and fibre board. The hydraulic feed is said to be quiet, vibrationless, and under positive control at all times. Operation for deep drilling is said to be unusually accurate, with provision for micrometer depth adjustment and quick change from continuous to intermittent feed.

The machine is available in four lengths, 3, 4, 5, and 6 ft. Each length



has a cross line spindle adjustment of 12 in. The hydraulic pump drive is from a 2 hp. motor. Spindle drive is by a 5 or 7½ hp. motor; 1800 r.p.m. chain drive; and 1200 r.p.m. coupled drive.

The speed of the table, upward, ranged from 40 to 100 in. per minute. Spindles rotate at 1800 r.p.m. Floor space varies from 54 x 48 in. to 54 x 84 in. on the larger size.

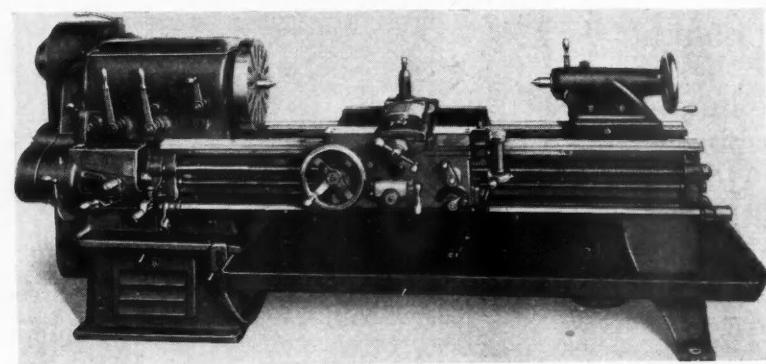
Reed-Prentice Heavy Duty Lathes

A line of 16-speed heavy sliding gear head lathes has been added by the Reed-Prentice Corp., Worcester, Mass. This will be available in 14 in., 16 in.,

1. Quick change gear mechanism providing all thread and feed changes without the use of pick-off gears.

2. End gears mounted on anti-friction bearings.

The use of the four bearing spin-



16 in. heavy, and 20 in. sizes. The following features which are also incorporated in the 8-speed line are well worth noting:

idle mounting with precision Timken taper roller bearings has been retained in this new line, as well as other features of the 8-speed lathes.